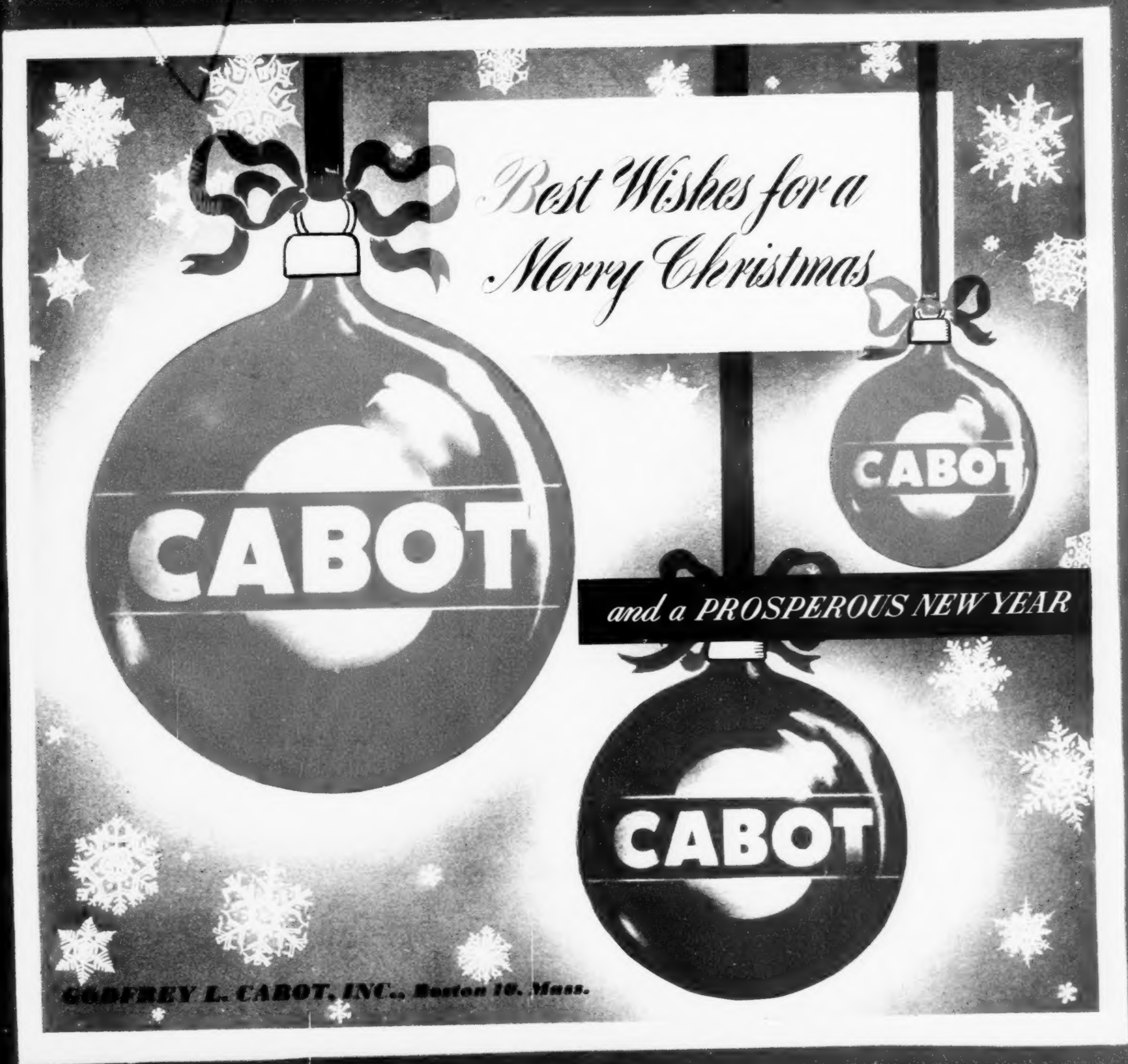
INDIA RUBBER WORLD

DECEMBER, 1948



INDIA RUBBER WORLD, December, 1948, Vol. 119, No. 3. Published Monthly by BILL BROTHERS PUBLISHING CORP., Office of Publication, Orange, Conn., with Editorial and Executive Offices at 386 Fourth Avenue, New York 16, N. Y., U.S.A. Entered as Second-Class Matter at the Post Office at Orange, Conn., under the act of March 3, 1879. Subscription United States and Mexico, $3.00 per year; Canada, $4.00; All Other Countries, $5.00; Single Copies 35 cents. Address Mail to New York Office

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...and discover an amazing combination of properties in HYCAR

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*Delrich E-Z Color Pak (Cudahy) Packaging Award, Modern Plastics competition. Visten Film by Visking. Package by Shellmar.

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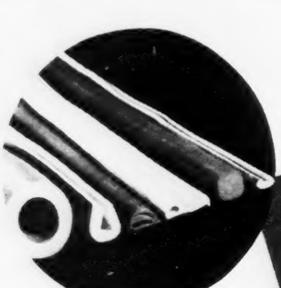

Why You Get Outstanding Results When You Extrude G-E Silicone Rubber Compound

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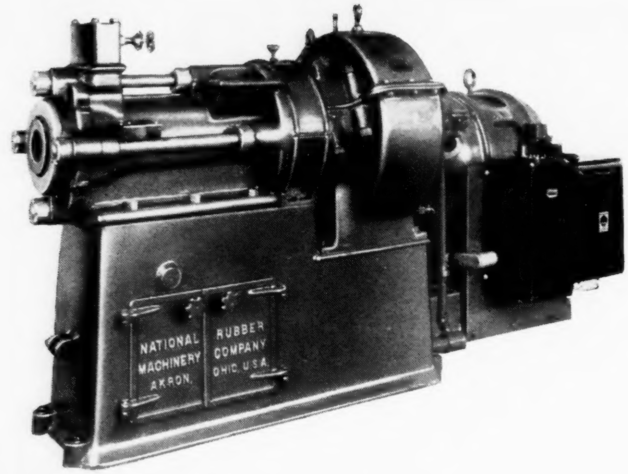

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NATIONAL Heavy Duty Tubing Machines are designed to solve *your* particular problems of production promptly.

Their performance, in terms of increased production, is another step forward in rubber processing techniques which advanced engineering makes possible.

National Heavy Duty Tubers are available in 8 different sizes ranging from 2″ to 12″ screw diameters, and smaller sizes for laboratory work.

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3. HEAVY CAST IRON CYLINDERS, water jacketed, with removable spiral sleeve equipped with hardened steel or Xaloy bushing.

4. HOPPERS, conveniently designed for manual or mechanical feeding.

5. MANIFOLDS are built in and equipped with four valves for heating or cooling cylinder as required.

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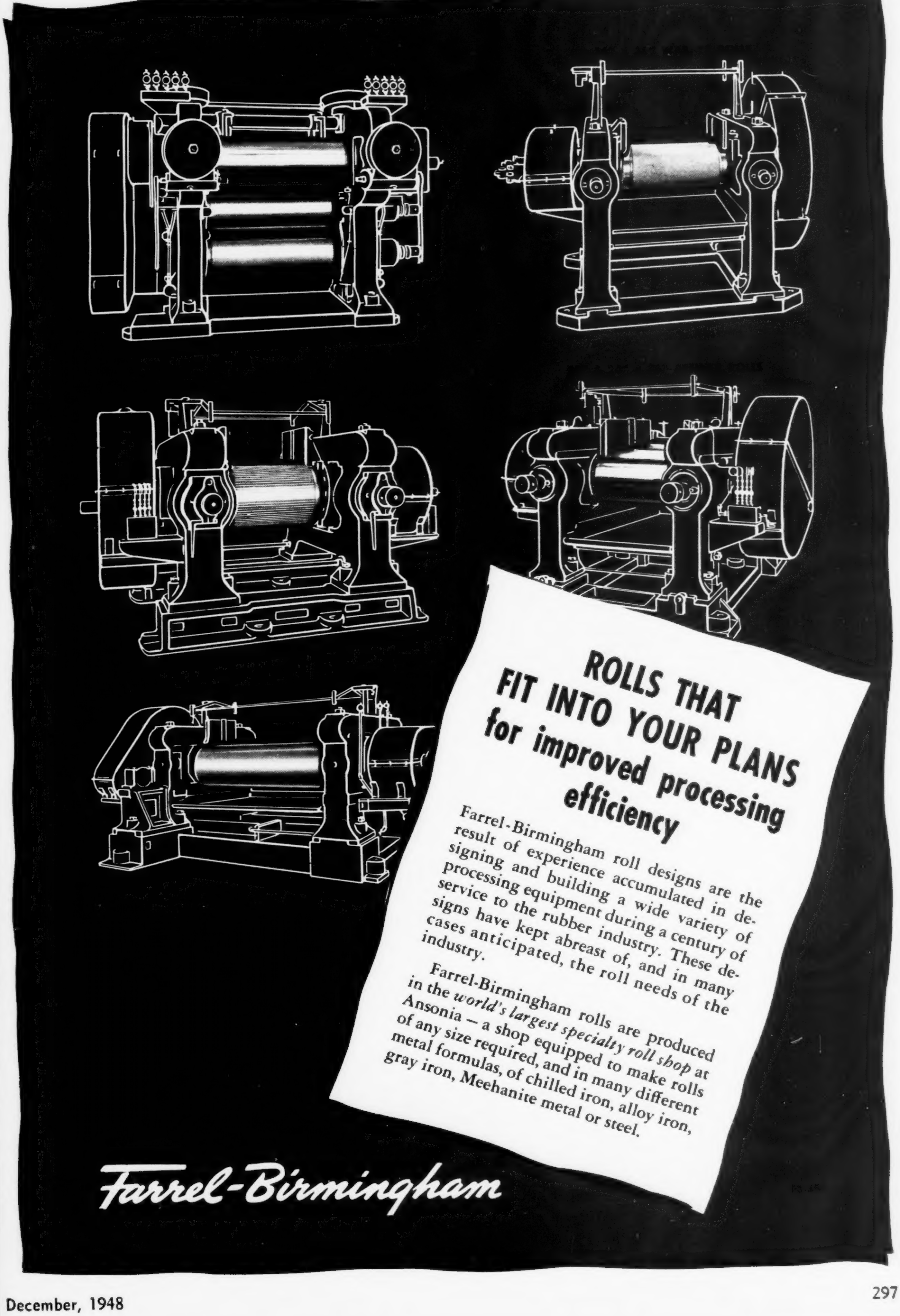
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- **RESIST HIGHER TEMPERATURES.**
- **IMPROVE CHEMICAL AND WEATHER RESISTANCE.**
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PHENOLIC RESINS

- MOLDING COMPOUNDS
- INDUSTRIAL RESINS
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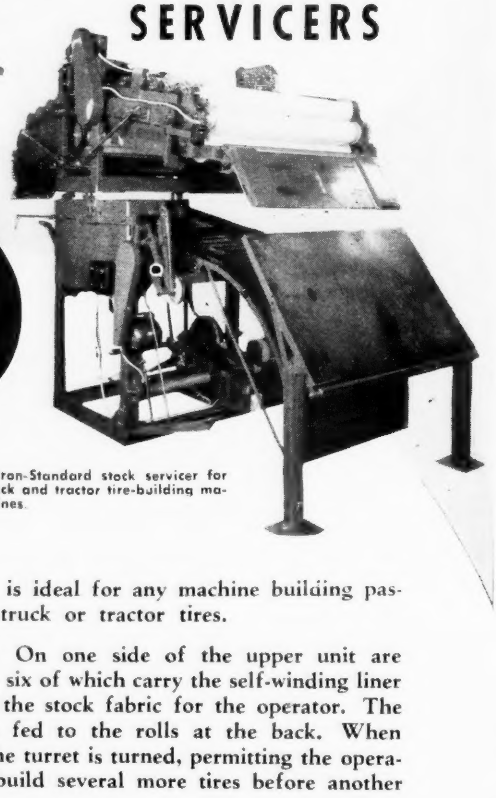
Help Your Tire Builders *Speed Up* with AKRON-STANDARD STOCK SERVICERS

Akron-Standard stock servicers are made in many sizes. Both sets of stock rolls are connected together by chain drive to sprockets from motors mounted on side of frame.

FOR USE WITH ANY SINGLE OR DUAL BEAD TIRE-BUILDING MACHINE



Akron-Standard stock servicer for truck and tractor tire-building machines.

Another Akron-Standard aid to modern, streamlined production — a stock servicer which supplies material to the tire builder without leaving his position (ideal for women operators). It handles plies, chafers, tread and breaker. No placing of fabric in loose liners — no more unnecessary handling anywhere! Uniform tension makes for a uniform product. The tire builder controls each roll with an index button which operates the motor drive. A limit switch automatically stops the roll. The stock rolls are filled so that each ply comes in proper sequence with the cord angles reversed correctly as applied to the drum. The Akron-Standard stock servicer is ideal for any machine building passenger, truck or tractor tires.

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Ask for our 40-page Bulletin "W-12", describing this and many other profit-earning types of Akron-Standard equipment.

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Rubber Industry Handling Jobs

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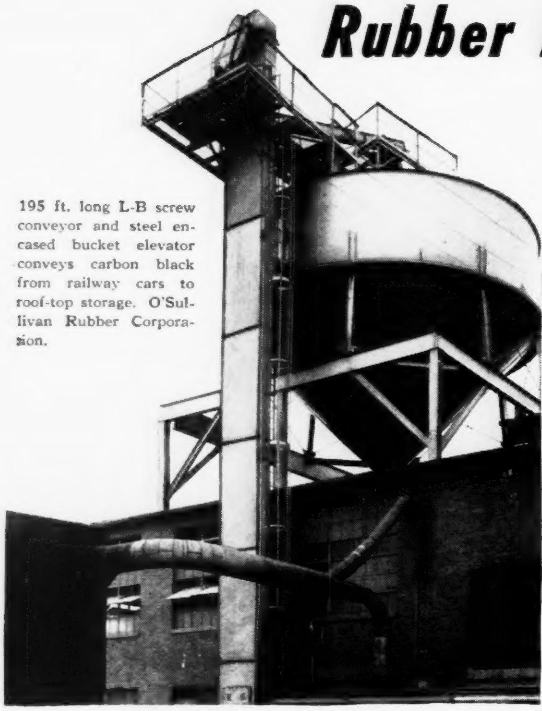
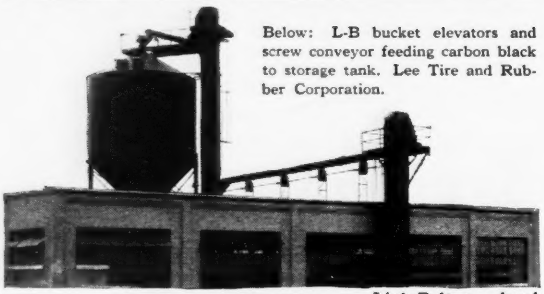
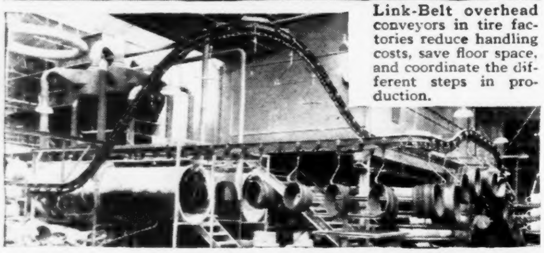
CONVEYORS



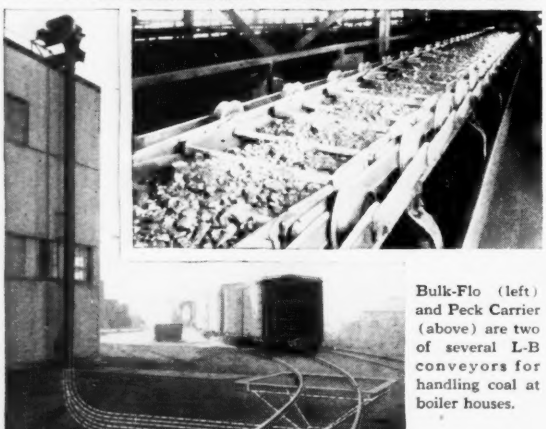
195 ft. long L-B screw conveyor and steel encased bucket elevator conveys carbon black from railway cars to roof-top storage. O'Sullivan Rubber Corporation.



Below: L-B bucket elevators and screw conveyor feeding carbon black to storage tank. Lee Tire and Rubber Corporation.



Link-Belt overhead conveyors in tire factories reduce handling costs, save floor space, and coordinate the different steps in production.



Bulk-Flo (left) and Peck Carrier (above) are two of several L-B conveyors for handling coal at boiler houses.

In the broad Link-Belt line, there's a type to suit every requirement . . . . .

● About the meanest handling job in the rubber industry is conveying carbon black, but makers and users alike are reporting highly satisfactory service from Link-Belt conveyors and elevators on this difficult assignment. Pictured here are typical installations of Link-Belt screw conveyors and bucket elevators, which have overcome major difficulties of handling this material in a clean and waste-free manner.

Link-Belt elevating and conveying machinery includes types especially suited to handling coal and ashes, as well as overhead conveyors for moving rubber sheets, rubber products and molds through the various processes. Link-Belt belt conveyors and Bulk-Flo elevator-conveyors have special advantages for certain types of materials. Consult Link-Belt and be sure to receive equipment of the right type, and helpful counsel from materials handling specialists, to make the most effective application.

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• Area of lineal yd. (one side)	x 2	sq. inches
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• If PRECISION CALENDERING SAVES YOU only one-half of one thousandth of an inch of stock	x .0005	
• YOU WILL SAVE PER RUNNING YARD		CU. IN. OF STOCK
• Approx. weight 1 cu. inch compounded stock	x .036	lbs.
• Approx. weight of stock saved per running yard		lbs.
• Average cost of stock at your calender	x ¢	a lb.
• YOUR SAVING, PER RUNNING YARD	¢	
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Naturally we'd welcome an opportunity to tell you more about the advantages of precision calendering and estimate the savings it could effect in your particular operation. Why not consult us . . . without obligation, of course.

SPECIFICATIONS

Adamson United New Precision Calender

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. . . are arranged for cooling and heating through longitudinal holes drilled near periphery of the roll. Uniform temperatures at center and ends of roll prevent uneven expansion and hold original contour.

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Equipped with precision-type roller bearings adjusted to zero clearance, flood oil lubricated at controlled temperature. Close fitting seals effectively retain all lubricant, preventing stock contamination. Rolls are ground in own bearings to assure exact concentricity under operating conditions.

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Adjustment for variable roll deflection obtained by crossing roll axes. Wide variety of stocks can be run with complete uniformity of gauge.

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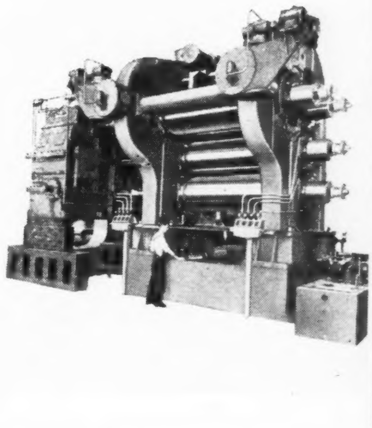
Each roll is individually driven through a universal spindle, permitting crossing the roll axes to compensate for roll deflection. A separate pinion stand mounts the fine-pitch roll connecting gears in a rigid housing. Connecting gears run on fixed centers, and are oil flood lubricated.



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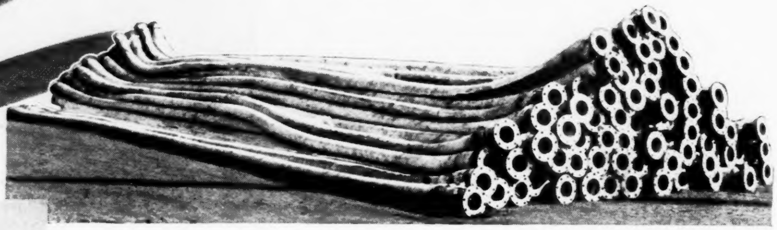
Neoprene casters for industrial trucks. Courtesy L. H. Gilmer Company, Division U. S. Rubber Company.

V-Belt drive on mechanical rotary drilling oil jig. Courtesy L. H. Gilmer Company, Division U. S. Rubber Company.

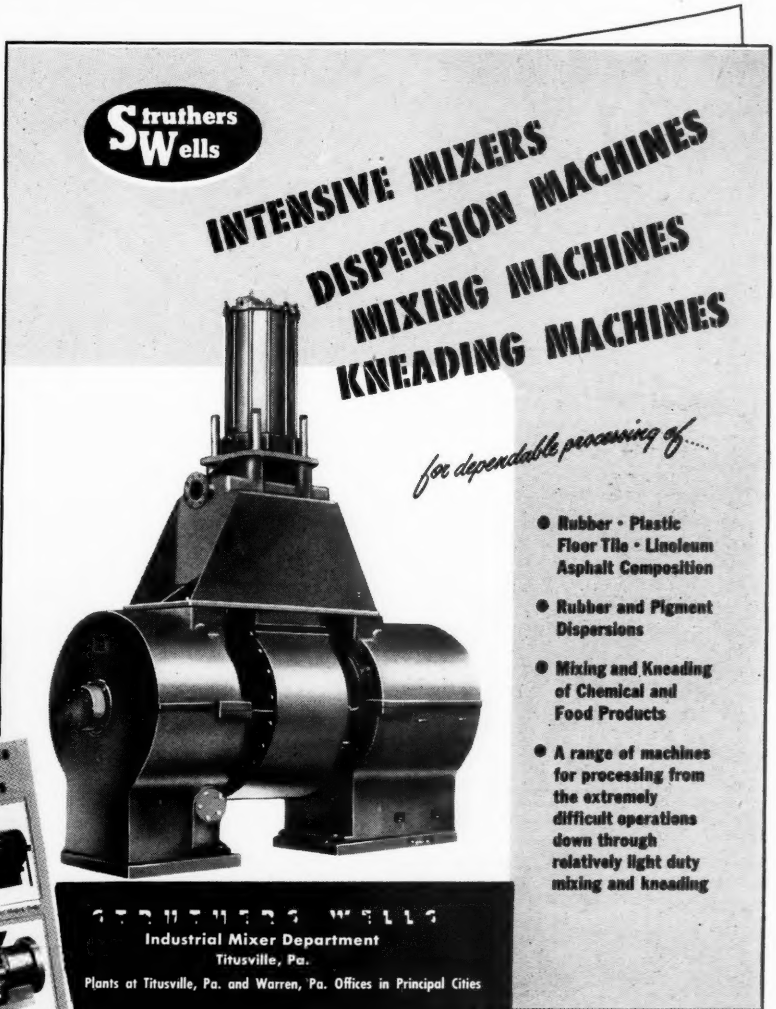


Neoprene oil suction and discharge hose for marine service. Courtesy Quaker Rubber Corporation, Philadelphia.

Neoprene covered seismograph cable. Courtesy General Geophysical Company.

this NEW BULLETIN

gives you important factual data



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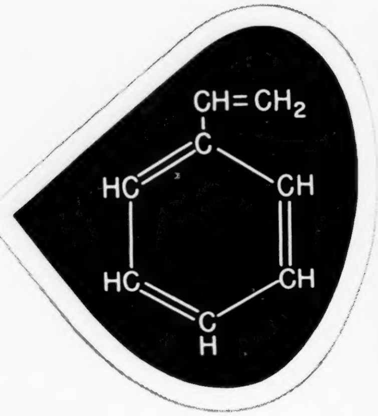
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December, 1948

Volume 119 Number 3

A Bill Brothers Publication

INDIA RUBBER WORLD

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ARTICLES

DEPARTMENTS — Pages

MARKET REVIEWS — Pages

STATISTICS

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INDIA
RUBBER WORLD

Volume 119 | New York, December, 1948 | Number 3

The Meaning of Test Results

R. G. Newton[1]

THIS paper was presented before the Rubber Technology Conference in London, England, in June, 1948. India Rubber World has been granted permission by the Conference to publish a few of the Conference papers prior to their publication in the bound volume, "Proceedings of the Rubber Technology Conference." Other papers will appear in succeeding issues. Editor.

TECHNOLOGICAL advances are generally based on the *difference* between two separate experiments, one involving the new feature, while the other is a "control," using the old feature. Technologists in the rubber industry have now become accustomed to the utility, and in many cases even the necessity, of employing statistical methods for determining the "meaning" of such differences between their experimental results. Thus it is well known that the "errors" of the experiment must be found before a decision can be taken whether or not the observed difference could reasonably be attributed to the "errors."

In the last three years about a dozen papers on rubber testing have illustrated these advantages of evaluating the errors (1-12).[2] Some of these papers are of a descriptive nature and deal with the statistical principles involved; the illustrations are taken from rubber testing (3, 8-9). Others employ statistical procedures to illustrate the need of a modification of a test method or for an improved technique of interpretation (2, 4, 10-12). Yet others used statistically planned experiments in order to clarify specially obscure points (1, 5-7). All these authors have evaluated the uncontrolled "errors" in the experiment, either by a process of replication, or from the interaction terms in an analysis of variance, or from the residual term in a regression analysis and have used these "errors" to decide the statistical significance of the difference in which they are interested. (Even though a difference between test results is statistically significant, it may not be *economically* significant; hence the economic "meaning" may well be another matter.)

It is the purpose of this paper to draw attention to yet other aspects of the "meaning" of a test result and to point out that some important factors are commonly ignored or overlooked; some of these factors involve the statistical "meaning"; while others are concerned with the physical "meaning" of the result and raise pertinent questions about the "use" to which the results are put.

Unsuspected Factors Which Increase the Error

Much of the past work on measuring the size of errors has been done in only one laboratory and often with only the one operator who normally performs the test. Quite frequently the tests have been made on one set of test specimens all made at the same time, but it can easily be shown, as has been effectively done by Buist and Davies (1), that the variation between repeat mixings is greater than the error of test, and thus the simple error of testing will not be adequate for examining the difference between two different mixings prepared, for example, to test a new compounding ingredient.

When tests are made in connection with purchasing specifications, it is evident that more than one laboratory will become involved, but the few comparisons so far made all indicate that unexpectedly excessive variations occur between different laboratories, or even between different operators in the same laboratory, so much so that the whole question of significance levels must be reconsidered.

For example, the standard deviation of a B.S. hardness measurement (B.S.903-1940), as carried out by one person, is about 1·2; hence such hardness readings on a piece of rubber are quite unlikely to vary over a range of more than five units, nor will the mean of four readings vary more than two units (13). These figures express something which is well known because it is an everyday experience that four hardness readings rarely vary by as much as three units. Unfortunately, when a study is made of different operators (14), it is found that they tend to get significantly different results, even when the test has been carefully explained to them. All the reasons for this are not properly understood, although it is known that the pocket-type instruments are very sensitive to hand pressure. Similarly, an examination of different hardness instruments, all of which are supposed to give the same reading, shows that they, also, vary unexpectedly widely; some of the differences in behavior are not understood, although others have been traced to differences in construction. Thus, if we do not know which operator will carry out the test, or which instrument he will use, experimental differences must be

[1] Research Association of British Rubber Manufacturers, Croydon, England.
[2] Numbers in parentheses refer to Bibliography items at end of this article.

increased from two units to five units before a significant effect can be claimed.

A similar story can be related for the tension-testing of rubber. Working in 1939, the author found that, taking the average of 16 laboratories, any one operator in one laboratory could claim a significant difference between two modulus values, each from four dumbbells, if the difference was only 9%; whereas the variation *between* the 16 laboratories was such that, if the comparisons were liable to be made at random between the laboratories, the minimum difference for which significance could be claimed (7) would have to be increased to 40%. This fourfold increase represents the inefficiency of testing due to lack of standardization between the laboratories in this country. The same unsatisfactory state of affairs exists in the United States: Morris and Gerwels (6) found the following ranges of variation between 21 different laboratories: hardness, 28%; elongation at break, 15%; tension strength, 48%; modulus, 75%; and tear strength, 79%. Taylor, Fielding, and Mooney (15) studied sources of variability in Mooney plasticity measurements and found that, even after special care was taken in standardizing the different laboratory plastometers, the variation between the laboratories was about four units, compared with a figure of one unit for one operator using one machine. Meuser, Stiehler, and Hackett (4) found that careful control checks with specially blended lots of polymer, together with instrumental modifications, decreased the variability of testing by a factor of two over a period of two years. Other unpublished work at the R.A.B.R.M. has shown that excessive variation between laboratories is found with resilience and abrasion tests, and it must evidently be expected with any test, however simple and "fool-proof" it may appear. In the majority of cases, therefore, the information about interlaboratory variation is not available, but it behooves all technologists to be very much on their guard against it and to realize that test results generally have appreciably less "meaning" than they might assume from a knowledge of their own errors of test.

The Discriminating Power of a Test

Some persons who have become accustomed to measuring the variability of test results fall into a trap by ignoring an important feature. A test method can have a small amount of variability for two reasons: because it is an effective method of test, having a small error, or because it is a grossly insensitive test and has such a small power of discriminating between materials that measurements tend always to be the same. Thus it is sometimes claimed that the Shore durometer is more "accurate" than the dead-load hardness instrument, when used with very soft rubbers, merely because it shows a smaller variation between the repeat readings on the same rubber. If the actual power of discriminating between two soft rubbers is examined, especially when more than one observer is concerned, the so-called "accuracy" is seen merely to be the effect of very poor discrimination (13). Few writers on rubber testing have considered this important aspect, but Buist and Davies (1) correctly point out that the discriminating power of a test is given by the ratio of the variances for "between rubbers" and "within rubbers," and they show, among many interesting facts, that permanent set tests have practically no power of discriminating between different types of carbon black, thus adding point to the view, now receiving recognition, that the present type of permanent set tests is of little value (16). The discriminating power of abrasion tests has been examined also (17), and Throdahl (11) considers the use of a "co-efficient of discrimination," but employs the simple concept of dividing the difference between the rubbers by the standard error of the difference.

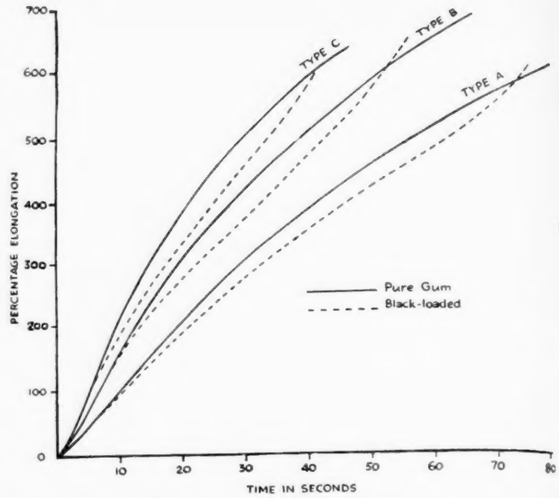

Fig. 1. Relation between Percentage Elongation and Time of Stretching for Standard Dumbbells (B.S.903-1940, Types A-C), When the Lower Grip Moves at 20 Inches per Minute, Showing That the Rate of Stretching of the Test Length Is not Constant

An advanced statistical technique is available for obtaining the maximum amount of discrimination from the test as it stands, or for combining different measurements in order to obtain the maximum discrimination between different materials. This technique is discriminant function analysis and has been applied to flex-cracking tests (18).

Some Physical Factors Which Are Ignored

It is evident from the discussion under "Factors Which Increase the Error" that the standardizing procedures of different laboratories are inadequate, and this subject has been considered in the recent ASTM symposium on rubber testing (4, 9-10, 15); many factors are discussed, especially by Schade and Roth (10), whose paper should be consulted by all interested in physical testing. An important factor which seems continually to have been ignored is that of the rate of stretching of the test piece in tension stress-strain tests. It has long been realized that a rapid separation of the grips produces a high elongation at break, and the factors involved have been discussed by the present author (7) who points out the need of standardizing the amount of the dumbbell held in the grips. It is still not sufficiently realized how serious this effect may be, or even that the rate of stretching of the test length decreases continually during the test, despite the constant rate of travel of the lower jaw. Figure 1 illustrates the effect well and is self-explanatory.

Variation in the amount of the sample held in the grips can also give rise to errors of quite a different nature. At the R.A.B.R.M. it is the general practice to dust the dumbbells with French chalk before determining the tension strength. On one occasion some tests were done without dusting, and a much lower tension strength value was obtained (2,750 instead of 3,500 lbs./sq. in.). Repeat tests made it abundantly clear that the effect was a real one, which was eventually traced to the use of "Type C" (B.S. 903) dumbbells. When used with unfilled rubbers, these dumbbells often failed to break, owing to restricted travel of the tester, and the operators had, therefore, formed the habit of placing them in the roller grips so that the gage mark was over the metal bar. When stretching started, the gage mark moved clear of

the metal, and the break occurred within the narrow test length. When French chalk was used, this occurred smoothly, but in its absence alternate sticking and slipping took place which caused slight damage to the undersurface at the end of the test length, thus producing premature failure. If the dumbbells were inserted with a free test length, or if they were dusted and inserted as had been usual, the tension strength was increased, and no significant difference was found between the two values.

The problem of improved standardization of testing is also going to be complicated by three features: (a) factors which have been ignored; (b) factors which are at present very imperfectly understood, and (c) uncertainties in the use to which the test results will be put. Each of these features will be illustrated by an example.

(a) In the early testing of the electric breakdown strength of rubbers it was evident that some rubbers with high dielectric strength could not be tested in air owing to "flash-over," the air breaking down before the rubber. Oils may have higher electric strength, and it was found that breakdown would occur in the rubber when the tests were made under oil, but it has only recently been realized (20) that discharges occurring in the oil would produce an uneven stress distribution and be responsible for an unduly low breakdown value. If, on the other hand, the oil is rendered partially conductive, such discharges are less violent, and the apparent breakdown strength of the rubber may be raised as much as 30%; this was thus a question of "ignorance is bliss." It would appear that the essential feature to be specified is that the breakdown should occur *beneath the electrode*, and it is recommended that this should be done.

(b) It has been convincingly shown by Gurney and Gough (21) that the flow of rubber in the mold during the initial stages of vulcanization may be responsible for marked effects of grain, and that the direction and extent of the grain depend critically upon some features of mold design which are not at present controlled. The introduction of a special mold design and special details of mold filling may be difficult and take a long time, but it may usefully be coupled with the suggestion of Schade and Roth (10) that samples should be vulcanized in cavities in the press platens.

(c) The stress-strain curves for rubbers which contain reinforcing fillers are very sensitive to the previous history of the sample, as has been clearly shown by Mullins (22), and it would appear that the "normal" stress-strain curve is unique and can never be repeated again on the test piece, no matter how long or under what conditions it is allowed to recover. On the other hand, after some five to ten repeated stretches to some elongation short of the breaking point, the stress-strain curve (below the prestretch elongation) becomes closely reproducible at will. The consequences of this condition are considerably complicated, but a brief discussion will be given here, under the following four items:

(*a*) The unique curve obtained from the first stretch is due to the formation of "filler structure," and hence modulus values from this curve can be used as a measure of the structure of which a filler is capable.

(*b*) The difficulty in specifying a previous stretch in a stress-strain test is that the "conditioning" effect is produced only for elongations less than the conditioning stretch, and a strictly logical approach would require the test piece to be broken before testing. On the other hand, if a purely arbitrary decision were made to stretch the dumbbell to (say) three-quarters of the breaking elongation before making the stress-strain test, a comparison of the reduced modulus obtained in this test with that from test (*a*) would provide a measure of "filler-structure."

(*c*) For design purposes the unique value given by (*a*) may be of little value, and this fact is recognized in a number of tests which are used by designers. For example, rebound resilience and compression stress-strain tests are frequently preceded by "conditioning" cycles; while special-service articles such as shock-absorber cord are often treated in this way. It is also interesting to note that a similar procedure is advocated even in a recent test for measuring thermal expansion. Thus, if the strain involved in service usage is known, it is suggested that for design purposes the samples be repeatedly stretched to this elongation before the modulus is determined.

(*d*) It is important to realize that the tension strength and elongation at break of most compounds are not appreciably altered by previous stretching, although a claim has been made (23) that a change of 20% can be produced; this is, however, quite small compared with the large changes in modulus which occur (22). It is often claimed that the tension strength is a measure of quality of the rubber, but the important work of Buist and Davies (1) has shown that tension strength is not highly correlated with any other property in natural rubber compounds although it is correlated with tear and abrasion in neoprene compounds.

Correlation with Service Tests

Laboratory test results have their fullest justification if they show high correlation with the behavior of rubber in actual service. It is well known that this correlation is usually very poor, but part of the difficulty is due to the small reproducibility of service trials; for example, walking trials for footwear and test-car runs for tires are notoriously difficult to reproduce; different results are obtained if the wearer of the shoes, or the position of the tire on the vehicle, is changed. Some technologists appear to have despaired of ever obtaining good reproducibility, so much so that it seems necessary to point out that service trials are amenable to statistical handling, and two examples will be mentioned briefly. The R.A.B.R.M. has recently had the good fortune to be able to cooperate with a firm which tests its own tires on a test car. By replanning the test it was possible to improve the accuracy so that the change in abrasive index required for a significant difference was reduced from 28 to 10% for a total wear of only 1,600 miles running. The other example relates to the prediction of service life of footwear, in which the R.A.B.R.M., after extensive work on "abrasive indices" of rubbers, recommended a laboratory test which could be expected to give reasonable correlation with service behavior. After the introduction during the war of a revised Board of Trade specification for civilian footwear and soles, based upon this work, not a single complaint was received by the Board regarding the durability of the soles and heels supplied to the public.

Suggestions for Cooperative Experiments

The desirable correlations with service behavior, discussed under "Correlation with Service Tests," will certainly not be attainable and will not even be very useful until the excessive inter-laboratory variation, described under "Unsuspected Factors Which Increase the Error," has been greatly reduced. As the magnitude of this inter-laboratory variation is at present known for only a few test-methods, steps should be taken to determine it for all the important tests; special attention should be given to those used in purchasing specifications. This can be done in one of two ways: the best way would be to organize a large-scale cooperative program between all

(*Continued on page 344*)

A Study of the Effect of a Petroleum-Type Plasticizer on Various Furnace Blacks in Natural Rubber[1]

R. E. Elliott[2] and H. A. Winkelmann[3]

THE past 10 to 15 years have seen a large increase in the volume of furnace blacks used by the rubber industry. These blacks, which in 1935 represented only 10% of the carbon black output, have now increased to about 50% of the total production. This rapid growth has been due in part to the increased demand for the furnace-type blacks in the wartime GR-S program. Also, the increasing scarcity of natural gas and the low yields inherent in the channel black process have been contributing factors. It is interesting to note that, whereas the channel black process has a yield of only about 1.5 pounds of black per 1,000 cubic feet of gas, the various furnace black processes yield up to 16 pounds of black per 1,000 cubic feet of gas. These factors have led the various carbon black manufacturers to intensify their efforts toward bringing the quality of the furnace blacks up to that of the channels. The large number of papers presented at recent meetings of the Division of Rubber Chemistry of the American Chemical Society and at various local rubber groups is further evidence of the current interest in the various furnace-type blacks.

New Reinforcing Furnace Blacks

Recent developments in furnace black manufacture have made possible the new reinforcing types, the so-called RF blacks. These are Kosmos 60-Dixie 60 (United Carbon Co.), Philblack O (Phillips Petroleum), Sterling 105 (Cabot), and Statex K (Columbian Carbon). The RF blacks have the finest particle size of all the furnace types, being next to the channels in this respect. They impart a high degree of reinforcement and resistance to abrasion to both natural and synthetic rubber. Also, their low acceleration requirement is a distinct advantage to the rubber compounder. Drogin and Bishop[4] have presented a detailed comparison of these and other blacks in both natural and the various synthetic rubbers.

The RF blacks, however, do present some compounding and processing problems to the rubber manufacturer. Having a much higher pH than the channel blacks, the RF blacks give a faster cure and have a greater scorching tendency in both GR-S and natural rubber. The RF blacks impart quicker scorch than any of the other furnace-type blacks. Reduction of accelerator using mercaptobenzothiazole retards the cure and increases scorch time; this, however, is only slight in the case of the RF blacks in natural rubber.[5] Excessive accelerator reduction may lead to "accelerator starvation."[6] Regardless of the type of accelerator used, the RF blacks are always differentiated in the same order, although the different accelerators will vary widely as to their curing rates and as to the physical properties which they impart to the compound.[7]

[1] Presented before the Division of Rubber Chemistry, A. C. S., Chicago, Ill., Apr. 23, 1948.
[2] Standard Oil Co. (Indiana), Chicago.
[3] Dryden Rubber Division, Sheller Mfg. Corp., Chicago.
[4] "Today's Furnace Blacks," p. 40. United Carbon Co., Charleston, W. Va. (1948).
[5] *Ibid.*, p. 65.
[6] Cranor, Snyder, Cobbe, India Rubber World, 117, 749 (1948).
[7] Drogin and Bishop, "Today's Furnace Blacks," p. 109.

Experimental Details

The following work was undertaken to investigate the effect of a petroleum-type plasticizer on the processability and physical properties of a natural rubber compound reinforced with the various RF blacks. It was felt that by the use of such a plasticizer the various processing difficulties characteristic of these blacks might be minimized while at the same time good physical properties and curing characteristics are maintained. The plasticizer used is a mixture of high boiling, aromatic petroleum hydrocarbons. This plasticizer is characterized by the following properties:

PROPERTIES OF PETROLEUM PLASTICIZER USED

Specific gravity	—	1.020
S.U.V. @ 210° F.	—	450-550
Viscosity index*	—	—365
Flash, °F.	—	510
Pour, °F.	—	70
Iodine number	—	13
Dist. 1mm, °F.		
Initial	—	445
10%	—	511

*ASTM Method 567-41.

Five basic compounds have been studied, comparing four different RF blacks, a total of 20 compounds in all. The blacks are those mentioned above: namely, Kosmos 60, Philblack O, Sterling 105, and Statex K. The plasticizer content has been varied as follows (see Table 1)—0 parts (Compound No. 1), five parts (Compound No. 2), 10 parts (Compounds No. 3 and 4) and 40 parts (Compound No. 5). In Compound No. 5 the carbon black has been increased from 50 to 100 parts in order to maintain comparable hardness. Compound No. 4 is the same as No. 3 except that the sulfur has been reduced from 3.0 parts to 2.375 parts in order to study the effect of sulfur reduction.

TABLE 1. PETROLEUM PLASTICIZED, RF BLACK TEST COMPOUNDS

Compound No.	1	2	3	4	5
Smoked sheets	100.0	100.0	100.0	100.0	100.0
Zinc oxide	5.0	5.0	5.0	5.0	5.0
Stearic acid	2.0	2.0	2.0	2.0	2.0
B-L-E Pwd.	1.0	1.0	1.0	1.0	1.0
Sulfur	3.0	3.0	3.0	2.375	3.0
Altax	1.0	1.0	1.0	1.0	1.0
Indonex 638½	0.0	5.0	10.0	10.0	40.0
Carbon black*	50.0	50.0	50.0	50.0	100.0
	162.0	167.0	172.0	171.375	252.0
Specific Gravity	1.14	1.13	1.13	1.13	1.06

*Various RF Blacks as indicated on the graphs and charts.

For this study, rubber from one batch of smoked sheets was masticated in a Banbury; then each compound was mill mixed. Each compound was given three cures at 240° F., eight cures at 287° F., and eight cures at 316° F. In the case of Compound No. 4, containing reduced sulfur, two extra cures were run at 240° F., and the 90-minute cure at 287° F. was replaced with a five-minute cure.

A visual examination disclosed that after standing the

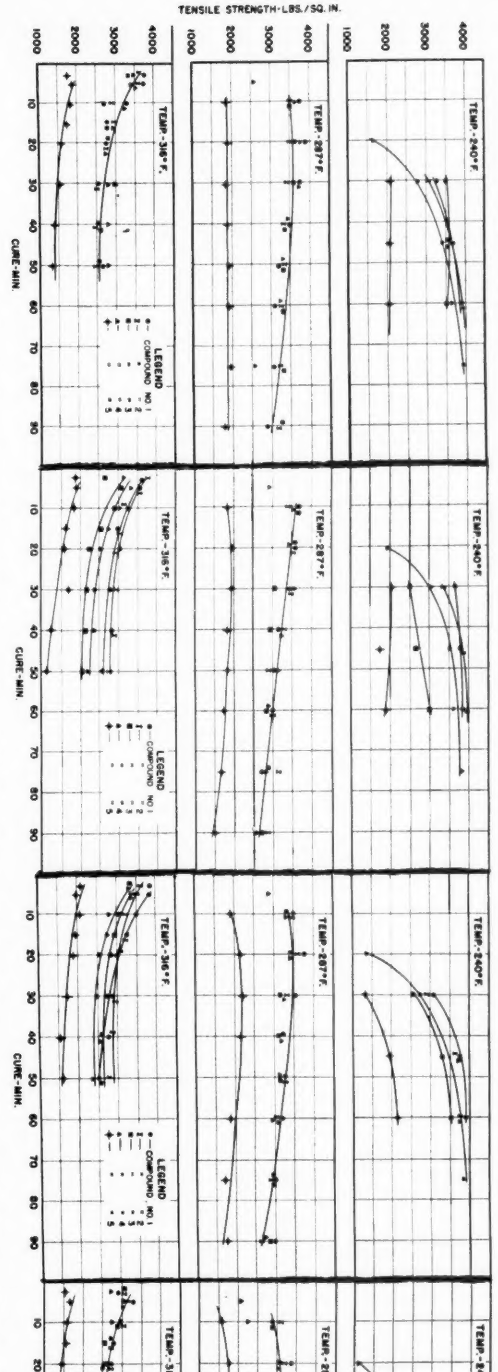

Fig. 1. Tensile Strength *vs.* Cure at Three Temperatures for Five Natural Rubber Compounds and Comparing Four Different RF Blacks

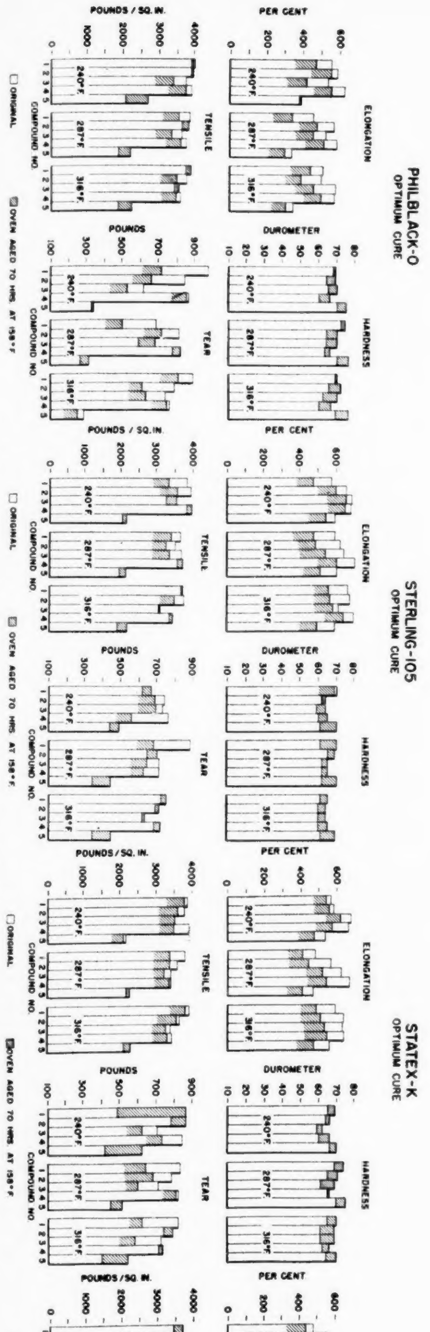

Fig. 2. Original and Aged Properties of Five Natural Rubber Compounds with Four Different RF Blacks

uncured compounds showed a varying degree of sulfur bloom. This ranged from a heavy bloom on the compounds containing no plasticizer to very slight bloom on those containing 10 parts or more. The compounds containing 40 parts plasticizer showed a minimum amount of bloom even after prolonged standing. This same effect was noted on the cured samples, in which case it was most pronounced on the shorter cures at 240° F. The degree of bloom was dependent mostly on plasticizer content and on time and temperature of cure and seemed to be generally independent of the black used. The use of this type of plasticizer, therefore, has the advantage of controlling sulfur bloom, thereby aiding in adhesion and in the plying and molding of uncured compounds.

Test Results

When tensile strength is plotted against time of cure for each of the curing temperatures (see Figure 1), it will be seen that in general the curves either coincide or run practically parallel. The difference in tensile strength is due to plasticizer loading, but even this is very slight and not always consistent. Compound No. 5, containing increased black and plasticizer, is somewhat lower in tensile as is to be expected, but it still maintains the same curing characteristics. The greatest difference to be found between the various blacks, except for some differences in degree of reinforcement, is in the configuration of the curing curves at 240° F. Differences at 287 and 316° F. are very slight. Agreement is so close between the various compounds using a given black that only one curve has been drawn in most cases for the sake of clarity. It can be seen from these data that the use of the plasticizer has had little or no effect on the rate of cure for any of the blacks tested, or at any of the curing temperatures. It will also be noted that reduced sulfur (Compound No. 4) has only a slight retarding effect on the cure, and this condition holds true for all four of the blacks. In the case of this compound two extra cures were made at 240° F., but the same general trend is evident.

Figure 2 shows the tensile strength, elongation, hardness, and tear on all compounds for all four blacks. Data are presented for the optimum cure at each of the three curing temperatures. Both original data and results after aging 70 hours @ 158° F. are shown. Tensile strength was run according to ASTM;[8] elongation is reported at break; hardness was determined with a hand operated Shore durometer, Type A; and tear was run according to ASTM.[9]

An examination of these bar charts shows that certain variations exist between the various blacks which are more or less consistent throughout the range of compounds. Philblack O generally gives the highest tensile strength, followed closely by Sterling 105 and Statex K. Sterling 105 gives the highest elongation, with Statex K second. There is but slight difference in hardness between the four blacks for comparable compounds. The variation is considerable between the results on tear, but Philblack O is generally higher.

After aging, Sterling 105 shows a decrease in tensile strength for Compounds Nos. 1, 2, and 3 and a small increase for Compounds Nos. 4 and 5. Philblack O changes very slightly except for compound No. 5, where it shows a decided increase. Using Statex K, the tensile strength, after aging, decreases in most instances; it shows no change in the case of Compound No. 3 with the 240° F. cure and only a slight increase in the case of Compound No. 5 at both the 287 and 316° F. cures. In

[8] ASTM Designation: D 412-41.
[9] ASTM Designation: D 624-44.
[10] ASTM Designation: D 395-47T Method B.

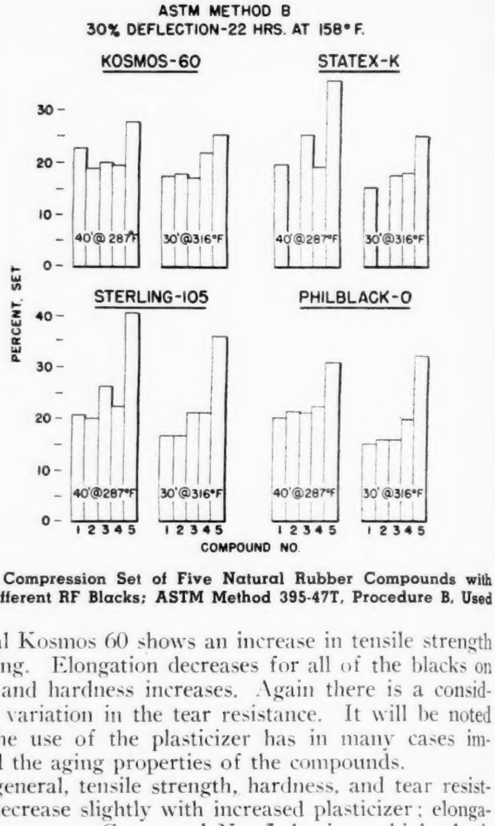

Fig. 3. Compression Set of Five Natural Rubber Compounds with Four Different RF Blacks; ASTM Method 395-47T, Procedure B, Used

general Kosmos 60 shows an increase in tensile strength on aging. Elongation decreases for all of the blacks on aging and hardness increases. Again there is a considerable variation in the tear resistance. It will be noted that the use of the plasticizer has in many cases improved the aging properties of the compounds.

In general, tensile strength, hardness, and tear resistance decrease slightly with increased plasticizer; elongation increases. Compound No. 5, having a high plasticizer and filler loading, is lower in tensile strength, elongation, and tear resistance than the other higher quality compounds, which condition is to be expected. After oven aging, this compound shows a general increase in tensile and tear for all of the blacks.

Reduction of sulfur from 3.0 parts to 2.375 parts has very little effect on the physical properties at optimum cure, as can be seen by comparing Compounds Nos. 3 and 4 for each of the blacks. Also it does not have any appreciable effect upon the aging characteristics.

Figure 3 shows the compression set of all of the compounds using the four blacks. Compression set was run according to ASTM, Method B,[10] using 30% deflection, 22 hours @ 158° F. Test specimens were cured 40 minutes at 287° F. and 30 minutes at 316° F. cures. All of the blacks give quite comparable results, and in each case the 316° F. cure shows slightly lower compression set. As is to be expected, Compound No. 5 has the highest compression set for all blacks and at both cures. All other compounds are in very close agreement, and it will be noted that reduced sulfur (see Compound No. 4) has little, if any, effect on the compression set.

Summary and Conclusions

In general, it can be said that the use of a petroleum-type plasticizer, consisting of high boiling, aromatic hydrocarbons, as a processing aid for natural rubber compounds, reinforced with RF blacks, produces no adverse effects on the general physical properties of the compounds. Its effect on aging is generally beneficial and it does not appreciably alter the curing characteristics of the compounds. The use of such a plasticizer improves the processability of the various reinforcing furnace blacks, but does not alter their comparative compounding properties.

Drying of Latex Rubber Deposits

E. G. Partridge[2] and M. E. Hansen[2]

THE drying of latex deposits is of utmost importance in the manufacture of rubber articles made from either synthetic or natural rubber latex. There are two distinct general types of latex deposits: one in which the article is made by so-called straight dipping, and the other in which the article is made by a coagulant-dip method. With each type of deposit the proper drying techniques are essential, and general drying principles apply to each.

Straight dipping may be described as the dipping of a bare form into a liquid latex compound, without the use of a coagulant either before or after the dip into the latex. Rubber latex is a colloidal dispersion; the rubber, in the form of tiny particles, is dispersed in a water medium. Concentrations are varied, depending upon the use to which the latex compound is put. When a bare form is immersed into a latex dispersion, the amount of latex which adheres to the form after withdrawal is dependent upon the concentration and viscosity of the dispersion, the speed of withdrawal of the form, the flow of the latex upon the surface of the form, and the turning or other manipulations which prevent the liquid from dripping off the form before gelation or drying.

Regardless of the concentration or other factors which control the amount of liquid retained on the form, a drying procedure is necessary in making the completed article. The amount of water to be removed is the same amount expressed in percentage as that which occurs in the latex mix itself. In general, a finished thickness of between 0.001-inch and 0.003-inch can be obtained for each dip made. Greater thicknesses can be obtained by repeated dippings. In any event, some drying is necessary after each dip, and finally, a complete removal of water is necessary before the article can be completed.

When an article is made in a single dipping, the complete drying is done in one operation; while with more than one dipping, complete removal of water need not be effected until after the last dipping is completed.

In single dipping, the latex film passes through two stages of wetness during the drying procedure. The first stage can be called "coagulation," and the second stage can be called "drying." The first stage consists of evaporating enough of the water so that coagulation of the deposit occurs. Since latex is a colloidal dispersion, each particle has on its surface an electrical charge. In ordinary latex this charge is negative, although positively charged latices can be produced. In either case, because of the same charge on each particle, the particles remain dispersed because like charges repel each other. The particles exhibit Brownian motion which can be seen under a microscope. For that reason, when straight dipping methods are used, enough drying or water removal must first be done so that the deposit becomes coagulated, in spite of the like charges on each particle.

The First Stage of Drying

For this first stage of drying, called coagulation, the condition of the air must be right. The most important condition is the dew point of the air, but temperature and velocity also must be considered. As in any drying procedure, the water to be removed must be vaporized. For each pound of water to be evaporated, approximately 1000 BTU of energy is required. Heated air is usually used to supply the necessary BTU's. The rapidity of the evaporation will depend upon the difference in temperature between that of the latex compound retained on the form and that of the air used. In general, the higher the temperature of the latex bath, the faster will be the evaporation of the water from the deposited film. In most instances the latex compound is maintained at room temperature, but may be held at a lower temperature. Jackets around the latex tank are often used in which cooling water is circulated in order to keep the latex mix at a lower temperature.

The reason for this cooling is to maintain uniform viscosity, concentration, and to prevent, in some cases, any premature curing or vulcanization of the individual rubber particles, which usually causes a less perfect rubber film. In many instances, however, prevulcanization of the liquid latex is advocated where it is advisable to decrease the processing time of manufacture and where a film does not require the most perfect physical characteristics of the rubber.

It is possible to form a wet film of latex and to put this film, before coagulation, into a stream of hot air and actually make it wetter and more fluid before drying actually begins; this action occurs when the dew point of the air is higher than the temperature of the latex film. When evaporation of water from a wet, flowable liquid takes place, the liquid is cooled by the removal of some of the energy in the liquid to furnish the heat of vaporization. Therefore, if the surface of the liquid is cooled to a temperature below that represented by the dew point of the air surrounding the film, water will condense from the air on to the surface of the wet latex film and thus make the film wetter. The phenomenon is readily illustrated by the "sweating" or condensation of water on the surface of a cold glass of water. When this condensation occurs, actual evaporation of water from the film does not take place until the temperature of the film is raised to a point above that of the dew point temperature. Two methods can be used to counteract this tendency: one is to maintain the temperature of the latex above the dew point temperature of the air or, second, to reduce the dew point temperature of the air. The first method can be used if the latex bath can be maintained at a higher temperature without any undesirable change occurring in the latex. The second method can be accomplished by reducing the absolute humidity (or total amount of moisture) of the air. The dew point of the air is dependent entirely upon the total amount of moisture present in the air (absolute humidity) and not the relative humidity of the air.

These conditions can be determined from a psychrometric chart. The following example will illustrate: if air is used at a dry bulb temperature of 85° F. and 50% relative humidity, the wet bulb temperature will be approximately 70.7° F.; the dew point will be 64.2° F.; and the air will contain 90 grains of moisture per pound of dry air. If that same air is heated to 150° F.; and no moisture is added to the air, the relative humidity will be decreased to 8%; the wet bulb temperature will be increased to 87° F.; but the dew point will remain at 64.2° F., and the air will continue to contain 90 grains of moisture per pound of dry air. It is, therefore, evident that if the air is heated, and consequently the relative humidity is reduced, there still can be no evaporation of moisture from the film until

[1] Presented before the Division of Rubber Chemistry, A. C. S., Los Angeles, Calif., July 22, 1948, by R. A. Lees, American Anode, Inc.
[2] American Anode, Inc., Akron, O.

the temperature of the film is raised to some temperature above 65° F. In fact, at either dry bulb temperature, moisture will condense on the surface and make the flowable film wetter before any drying can take place. If the first method, namely, controlling the temperature of the mix, is used, the temperature of the latex should be maintained at 70° F. or above.

If, however, the latex cannot be maintained at such temperature the only alternative is to reduce the absolute humidity of the air by a dehumidifying process. That can be accomplished by using one of two methods. It can be done by refrigeration, by which the water content of the air is reduced by condensation from it. The objection to this method is that usually after the air is cooled to remove the moisture it must again be heated to reduce the relative humidity, in order to obtain the fastest removal of water from the wet latex film. The second practical method of removal of moisture from the air is by use of a silica gel or similar material which will absorb the moisture from the air. The advantage of this method is that when the moisture is absorbed, the energy released (that is, the equivalent of the heat of vaporization, which is approximately 1000 BTU per pound of moisture absorbed) is converted to sensible heat and raises the temperature of the dried air passing through the dehumidifier. The temperature of the air passing through the dehumidifier will be raised 25 to 50° F., depending upon the amount of moisture removed from the air.

The Second Stage of Drying

After the latex film has been coagulated by the removal of enough water, the wet film is changed to a solid film (which cannot be reversed again to a liquid), but it will still contain a quantity of water which must be removed after the film has become solid. It makes little difference what the absolute humidity of the air is because it will do no damage to the deposit. At this stage the temperature of the deposit has usually been raised above the dew point; but, if condensation does occur, it will only increase the time necessary for complete drying. After coagulation the complete removal of water from the solid film is dependent upon the relative humidity and the velocity of the drying air.

At this point in this paper we will consider the drying of a coagulated film, as such, since the problems of complete drying are the same whether the deposit was made by straight dipping or by a coagulant-dip process.

When an article is made by the coagulant-dip method, the coagulant sets up the deposit. If the coagulant is applied to the form before any dipping is made in the latex, the thickness of the deposit is dependent upon the time the coagulant-treated form is allowed to remain in the latex bath. Shortly after the desired thickness has been obtained and the forms are withdrawn from the latex, the entire surface of the deposit is set up to a solid. This solid deposit is part water and part rubber, usually about the same concentration of each as that in the latex mix used.

In some instances, with certain accelerators present, the best cure cannot be obtained until all the water is evaporated. In most instances a superior rubber product is obtained when the article is completely dried before curing or vulcanizing. A prevulcanized compound can be used to speed up processing time, but if such a material is used, a rubber product with less desirable physical characteristics usually results.

It is possible to do both drying and curing in one oven, provided the proper temperatures and time and air circulation are provided. In the case of near-spherical products, such as balloons, a maximum air temperature of 175 to 180° F. should be used for drying, and a temperature of 220° F. to 250° F. for curing. For flat articles, such as a flat bathing cap, the drying temperature must be considerably lower to prevent blistering between the form and the deposit. In all instances when blowing or blistering occurs during drying, the temperature is too high.

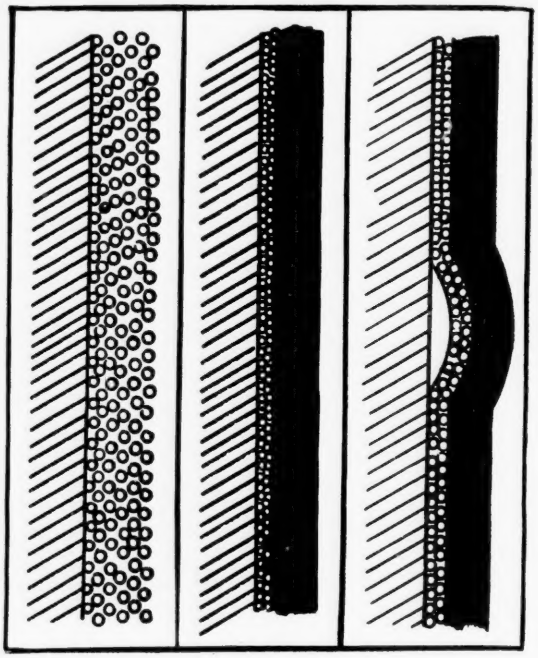

Fig. 1 Fig. 2 Fig. 3

As mentioned previously, when a coagulant-deposited latex film is obtained, the deposit on the form usually has the same concentration of solids as that in the liquid latex mix. As the coagulant diffuses into the latex, a solid film is formed around the form or mold. If mixes of approximately 50% solids are used, the coagulated deposit will also be approximately 50%; that is one half of the deposit will be water, and one half will be rubber constituents.

Figure 1 illustrates the character of a freshly deposited latex film. This illustration is typical of the cross-section of such a film. The form is illustrated by the shaded portion on the left; while the deposit is illustrated by the circles at the right. The deposit consists of a number of solid rubber particles, illustrated by the small circles, while the space between the circles represents the water medium which surrounds the rubber particles. The water medium is a continuous phase.

It is obvious from this illustration that during the drying operation all the water must be removed from the outside or exposed surface. Two fundamental principles, therefore, are involved in the drying of the coagulated film: first, the migration of the water to the outside surface, and, second, the removal of the water from the outside surface as fast as it migrates to this surface. The migration of the water to the outside surface is dependent upon the temperature of the deposit, and the removal of the water from the surface is dependent upon the air conditions, such as velocity and relative humidity.

During the leaching operation, usually used for any coagulant-treated deposit, after the deposit is formed and before drying, some of the water is eliminated from the deposit because the shrinkage of the deposit during the leaching process mechanically squeezes some of the water from the deposit. This action brings the coagulated particles closer together.

Figure 2 illustrates a partially dried deposit. The outside layer is almost dried and has shrunk because, as the water is removed from around the particles, they move closer together, thus greatly restricting the openings for further diffusion or migration of the water from the inner portions of the deposit. The rate of migration depends upon the temperature and the pressure of vaporized water which enables the water to pass through the dried layers of rubber. When proper drying conditions are present and the thickness of the deposit is not too great, a majority of the water is removed during the first 15 minutes in the drier. It takes considerably longer to remove totally all the water.

Figure 3 illustrates a deposit which is partially dried, as in Figure 2, but which has been subjected to too much heat that has caused a blister to be formed between the form surface and the deposit.

Since the water must migrate to the outside surface to be removed, and since this migration is dependent upon the temperature and the degree of shrinkage in the dried section, the temperature must be carefully controlled in the drier. The pressure generated by the vaporization of the water will force it to either surface of the deposit, whichever offers the least resistance. Therefore, if the vapor pressure generated is less than the resistance through the dried surface, the water vapor will be forced through the undried section on the form side. As this vapor pressure increases, more water vapor will collect under the deposit, and larger blisters will be formed.

One other force is involved in drying spherical articles, such as balloons, which counteracts the pressure of the vapor. This force is the pressure exerted by the shrinkage of the deposit during drying. This is illustrated in Figure 4. The arrows show the direction of the shrinkage forces exerted during drying on a round surface. This shrinkage force is toward the center of the form and therefore has a tendency to counteract the vapor pressure generated by moisture between the deposit and the form. The practical method of control of these forces is by keeping the temperature low enough so that the rate of vaporization of the water is no greater than that which will permit the vapor to migrate to the outside surface. In practice, it has been found that for articles such as balloons, which have a circular cross-section, a temperature of 175° to 180° F. is usually satisfactory; while for flat articles 140 to 150° F. is usually the maximum which can be used to eliminate blisters between the deposit and the form.

The material from which the form is made is also important. The faster the form absorbs heat, the higher the temperature permitted in the drying oven and the faster will be the drying. Materials such as aluminum, stainless steel, and porcelain are suitable for forms; while materials like rubber, plastics, and similar materials will increase the drying time necessary.

Figure 5 illustrates a perfectly dried film of latex rubber. There are no evidences of any appreciable amount of water left in the deposit, and the deposit is tight against the form.

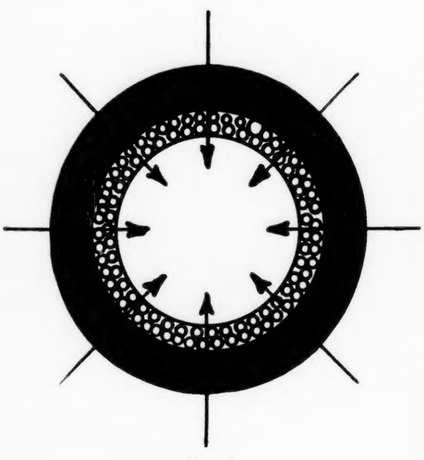

Fig. 4

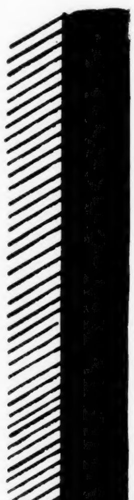

Fig. 5

Air Velocity and Other Considerations

As previously indicated, the function of air circulation in the drying oven is to remove the water vapor from the outside surface of the deposit as fast as it migrates to that surface. The amount of water which the air is capable of holding depends upon the moisture content of the air and the temperature of that air. Taking the conditions of air previously mentioned: namely, air at a dry bulb temperature of 85° F., and a 50% relative humidity, containing 90 grains of water per pound of dry air, the maximum amount of water which the air is capable of holding at 100% relative humidity would be 184 grains of moisture. When that air is heated to 150° F., the relative humidity will be reduced to 8%, but the total amount of moisture which it is capable of holding would be considerably greater than 800 grains of moisture. In fact, at 800 grains of moisture per pound of dry air, the air would have a relative humidity of 60%. It is readily seen, therefore, that the rate of evaporation will be much greater with the increased temperature. The deposits could be dried at 85° F., but could be done much faster at 150° F. Heating the air will decrease the relative humidity, but will not change the dew point temperature unless actual moisture is either added to the air or taken away from it.

It is essential that the air have a definite and controlled circulation to obtain the maximum evaporation of the moisture. When there is very little or no circulation of the air, the air immediately surrounding the deposit soon becomes saturated with moisture, and until this saturated air is replaced with low-humidity air, no additional drying can take place. Therefore, in an oven in which no air circulates, the deposit will never dry satisfactorily, regardless of the temperature of the air, if the air around the deposits becomes saturated with moisture.

Experiments have shown that a linear velocity of 200 feet per minute is ample and that no advantage is obtained with a greater velocity. This velocity is that of the air passing the surface of the forms and not that from the duct work or the fan. Two hundred feet per minute is equivalent to a speed of 2.27 miles per hour, which in itself is a very low velocity. Table 1 shows some very simple ways or rule-of-thumb methods of judging the velocity of the air.

Table 1. Qualitative Estimation of Air Velocity

FPM	Nearest M.P.H.	Effect of Air Movement
0-100	0-1	Dead calm.
250	3	Lowest appreciable breeze—may be detected with moistened finger. Flags not stirred by breeze.
450	5	Slightest breeze felt readily. Slants smoke columns. Ripples some leaves; nods tips of grass. Flags droop, barely stirred by breeze.
900	10	Strong breeze or light wind. Bends weeds and twigs; stirs light dead leaves. Flags about 20 degrees from mast move perceptibly.
1300	15	Wind—moves dead leaves along ground; bends bushes; sways light leaves. Flags about 45 degrees from mast.
1750	20	Sends dry leaves into air; sways heavier limbs; stirs up dust. Flags about 60 degrees from mast.
2200	25	Bends heavy brush and limbs; sends dust and light debris into air. Flags fly straight out from mast.

A dead calm will be any movement less than 100 feet per minute. At 250 feet per minute, the air is moving at the lowest appreciable breeze. It may be detected with a moistened finger. Flags will not be stirred by the breeze. This range of circulation of the air is the one necessary in an oven for proper movement of the air past the deposits. The other velocities shown and methods of determining are of academic interest in the drying of latex deposits, being used mainly in target shooting or hunting where it is necessary to judge the velocity of air for adjustment of windage on the sights of a gun.

Design of ovens should be such that the air is forced through the oven and between the individual forms in the oven. The air will travel along the path of least resistance; and if large, open areas extend through the oven, most of the air will travel through these areas, and very little will pass directly between the forms themselves. In the general design of the oven, fan capacity for between five and ten changes of air per minute should be provided, and the duct work should be so designed that the air is forced between the forms. In general, cross-circulation is best, although vertical circulation is satisfactory, provided that the forms are mounted in such a way that there is no barrier to the air. Longitudinal circulation should rarely be used. The design should provide numerous air openings so that proper circulation and recirculation can be obtained. It is also important properly to distribute the air in the oven so that a uniform temperature is obtained. Temperature controls are important to maintain constant conditions.

Almost any source of heat can be used. Steam is usually the cheapest and the most easily controlled. If steam is used, the temperature of the steam in the heating coils should be at least 50° F. higher than that desired in the oven. Gas or oil-fired units are very satisfactory. Such units should not exchange the gases of combustion directly into the oven but should pass them through a heat exchange so that clean air can be heated and circulated. A fire hazard may be created by putting the combustion gases directly into the oven. Infrared heat has not been proved very satisfactory because of the difficulty in controlling the heat to the comparatively low temperatures used and also the difficulty of obtaining uniform temperatures. Other types of electrical heating units can be used but the cost of operation is excessive.

Conclusion

In conclusion, it may be stated that the general principles of drying of latex rubber desposits are much the same for drying any other article, but there are conditions present that make drying more difficult. The porosity of the deposits decreases as drying proceeds; consequently the diffusion of the water through the deposits is progressively slower. Blisters can be formed between the deposits and the forms, but the formation of blisters can be controlled. During drying, flowable films such as those created by straight dipping, can become wetter after being put into a drying oven. All of these difficulties can be overcome by the proper design of ovens and the proper applications of fundamental drying principles.

"Something about the Senses." Monsanto Chemical Co., St. Louis 4, Mo. 32 pages. The first part of this illustrated booklet presents a narrative story on the five senses, particularly those of taste and smell. The second part gives properties, applications, and general information on the company's coumarin, Ethavan, methyl salicylate, and vanillin and also contains tables showing the solubilities of these materials in water and other mixtures.

Meaning of Test Results

(*Continued from page 337*)

the test laboratories, as was done for tension-testing; while the alternative method would be to make available a central "pool" of test samples, with known properties, from which laboratories could obtain material for checking their test methods. The former method has the great advantage that all the material is tested at the same time, thus avoiding "aging" troubles, although these should not be serious (24); also the whole program is coordinated centrally, thus enabling the results to be analyzed and conclusions to be drawn for the benefit of the industry as a whole. Some firms, however, may feel reluctant to disclose a possible deficiency in their testing, despite assurances that the origin of the results would be strictly confidential and that the organizers are concerned with impartiality and anonymity (6-7); the central "pool" would then enable such firms to check their test procedure even though the industry would lose the benefit of learning from their experience. The investigation should be followed by an "inquest," after which further advice on standardization procedure could be issued, and this would be greatly facilitated by a central coordination of the program; the author believes that this method is the better one, and he hopes that the industry will adopt the suggestion.

Bibliography

(1) "Statistical Evaluation of Variations in Rubber Processes and Correlation of Physical Properties." J. M. Buist, O. L. Davies, *Rubber Chem. Tech.*, 20, 288 (1947).
(2) "Methods of Averaging Physical Test Results, Use of the Median." Buist, Davies, *India Rubber J.*, 102, 447 (1947).
(3) "Statistical Control in the Physical Testing of Rubber." J. D. Heide, India RUBBER WORLD, 114, 653 (1946).
(4) "Standardization of Testing and Inspection in Government Synthetic Rubber Plants." L. Meuser, R. D. Stiehler, R. W. Hackett, *Ibid.*, 117, 57 (1947).
(5) "Reproducibility of Tensile, Permanent Set, and Hardness Test Results in the Same Laboratory." J. F. Morley, B. D. Porritt, J. R. Scott, *Rubber Chem. Tech.*, 20, 551 (1947).
(6) "Variations of Physical Tests of Elastomers between Different Laboratories." H. B. Morris, C. H. Gerwels, *Rubber Age (N. Y.)*, 61, 323 (1947).
(7) "Comparison of Tensile Test Results Obtained in Different Laboratories. II." R. G. Newton, *J. Rubber Research*, 14, 113 (1945).
(8) "A Simplified Method of Calculating Standard Errors." Newton, *Chem. and Ind.*, 322 (1945).
(9) "The Use of Statistical Methods in Rubber Evaluation." M. M. Sandomire, "A.S.T.M. Symposium on Rubber Testing," Special Tech. Pub., 74, 95 (1947).
(10) "Developments and Improvements in Methods of Stress-Strain Testing of Rubber." J. W. Schade, F. L. Roth, India RUBBER WORLD, 116, 777 (1947).
(11) "Statistical Analysis of Plasticity Measurements of Natural and Synthetic Rubber." M. C. Throdahl, *J. Colloid Sci.*, 2, 187 (1947).
(12) "Applications of Statistical Methods to the Production of Synthetic Rubber." G. R. Vila, M. D. Gross, *Rubber Age (N. Y.)*, 57, 551 (1945).
(13) "R.A.B.R.M. Hardness Tester." Scott, Newton, *Rubber Chem. Tech.*, 14, 514 (1941).
(14) "A Study of the Accuracy of Hardness Testing." Newton, unpublished results from the R.A.B.R.M. (Research Report No. 56).
(15) "Development and Standardization of Tests for Evaluating the Processability of Rubber." *Rubber Age (N. Y.)*, 61, 567, 705 (1947).
(16) "Permanent Set Tests." L. Mullins, paper presented at the 1948 London Rubber Technology Conference. (To be published in a forthcoming issue of India RUBBER WORLD.)
(17) "Determination of Resistance to Abrasive Wear. XI. Influence of the Type of Abrasive." R. G. Newton, J. R. Scott, W. H. Willott, *J. Rubber Research*, 17, 69 (1948). "XII. Comparison of Akron and du Pont Abrasion Machines: Value of an Abrasive Index." Scott, *Ibid.*, 75.
(18) "Quantitative Method of Expressing Flex-Cracking Results." Newton, *Rubber Chem. Tech.*, 13, 694 (1940).
"Standardization of Rubber Flexing Tests." W. L. Stevens, India RUBBER WORLD, 102, 5, 36 (1940).
(19) "Effect of Dusting Agents on the Tension Test Results Obtained with Dumbbells." Mullins, unpublished results from the R.A.B.R.M. (Research Memorandum No. 315).
(20) "Note on the Measurement of Electrical Breakdown Strength; Effect of Surrounding Medium." Mullins, unpublished results from R.A.B.R.M. (Research Memorandum No. 323).
(21) "Molding Anisotropy." *Trans. Inst. Rubber Ind.*, 22, 132 (1946).
(22) "Effect of Stretching on the Properties of Rubber." Mullins, *J. Rubber Research*, 16, 275 (1947).
(23) "Rubber in Engineering." H.M.S.O., London, 1946; Chemical Publishing Co., Inc., Brooklyn, N. Y., 1946.
(24) "Effect of Prolonged Storage of Unvulcanized Stock on the Properties of the Vulcanizate." R. C. W. Moakes, A. L. Soden, *J. Rubber Research*, 17, 30 (1948).

Microscopical Method for Determining the Profile of the Edge of Rubber Test Specimens Cut with a Die

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and Rolla H. Taylor[2]

THE purpose of this report is to describe a method for determining the shape and the condition of the cut edge of a died-out rubber test specimen. It has long been recognized that in dieing out such specimens the cut edge is seldom, if ever, plane and perpendicular to the face of the test sheet. Studies have recently been made on the effect of this fault on the average width[3] of the specimen, and in 1932 measurements were made which showed the difference in width between the top and the bottom of the constricted portions of died-out tensile test specimens.[4] Neither of these methods, however, determined the actual profile of the cut edge. For some tests such as tear resistance it appears that the profile of the edge may be more important than the average width of the specimen. The method reported here was developed with this thought in mind.

Crescent-shaped tear-test specimens cut from different types of stock were procured from four different laboratories for the investigation, and attention was paid only to that portion of the specimen in which the nick[5] is placed. After several methods were investigated it was found that suitable results could be obtained through a modification of the frozen section technique commonly used in biological applications.

Preparation of the Sections

The location of the section to be examined was indicated by wax crayon lines drawn on the face of the specimen. The selection of the sections to be examined was determined by the crayon which remained after cutting. A ¼-inch length was cut from the center of each tear test specimen; the two cuts severed the piece being made at right angles to the long axis of the specimen. One or two drops of a concentrated solution of gum arabic were placed on the block of a freezing microtome and cooled to just above the freezing point. The cut length of the specimen was then placed into the viscous fluid with one of the severed ends against the block and frozen in place. Subsequently a mass of frozen gum arabic solution was built up around the piece of rubber until it was thoroughly embedded in a solid matrix of frozen solution. Extreme care was taken to insure the cutting of sections normal to the longitudinal axis of the specimen. Sections, 100 microns thick, were then sliced from the embedded specimen until the sections desired for analysis were obtained. Most of the rubber stocks were easily frozen by means of the jet of carbon dioxide on the underside of the microtome block, but for a few of the softer rubbers it was necessary to pour some of the acetone-carbon dioxide freezing mixture used by Smith and Saylor[6] over the embedded rubber before it became hard enough to section.

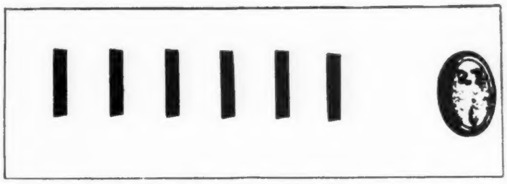

Fig. 1. Sections of Tear-Test Specimens Mounted on Microscope Slide for Examination

The sections were washed in several changes of distilled water and allowed to dry in place on a standard microscope slide. A picture of the slide is shown in Figure 1. Adherence of all the sections to the glass was entirely satisfactory and did not require the use of a fixative.

Observations on the Sections of Tear-Test Specimens

The sections were carefully checked for evidence of deformation due to cutting forces, and the section profile, when compared with that of the uncut specimen, appeared to be identical with it. In addition, adjacent sections were cut from the same specimen while the cutting force was applied against different aspects of the frozen block for each section. If any deformation had been taking place due to the cutting forces, it is obvious that identical sections would not have been produced by this procedure. Critical examination of these adjacent sections, however, failed to reveal any visible differences.

Photomicrographs of the sections were then made, using a Leitz Ultropak objective. A calibrated stage micrometer was photographed at the same magnification. Finally, the photomicrographs of sections and micrometer were printed by projection; the total magnification of the prints is about 45x.

The profiles of the die-cut edges of the sections varied widely from straight lines perpendicular to the surfaces of the rubber sheet from which they were cut. This variation both in shape and magnitude is illustrated in Figures 2, 3, 4, and 5. The profile shown in Figure 2 is for a section cut with the grain of a natural rubber tread specimen. Figure 3 is for a GR-I mechancial goods compound cut across the grain; while Figure 4 is for a GR-S tread stock, and Figure 5 is for a neoprene mechanical goods compound. There is no intention, of course, of attributing profile type to a characteristic of a given rubber stock since many other variables are involved.

For each of the sections analyzed the departure from perpendicularity, as represented by the distance from the

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[2] Work done while with NBS; now rubber technologist U. S. Natural Rubber Research Station, Bureau of Agricultural & Industrial Chemistry, Salinas, Calif.
[3] One method for determining average width is given in Section D-6-b, Specifications for Government Synthetic Rubbers, issued by Reconstruction Finance Corp., Office of Rubber Reserve, Washington, D. C.
[4] R. E. Lofton, *Ind. Eng. Chem. (Anal. Ed.)*, 4, 439 (1932).
[5] ASTM Specification D624-44: Tear Resistance of Vulcanized Rubber Compounds.
[6] *J. Res. NBS*, 21, 257 (1938). RP 1129.

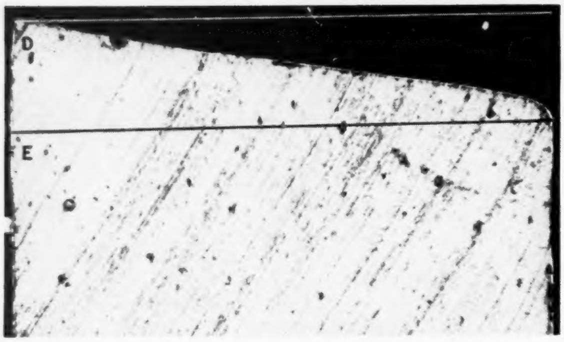


Fig. 2. Profile at Cut Edge of a Tear-Test Specimen Died-out of a Natural Rubber Tread Stock

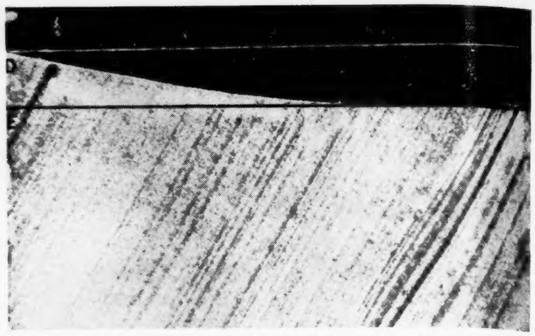


Fig. 3. Profile at Cut Edge of a Tear-Test Specimen Died-out of a GR-I Mechanical Goods-Type Stock

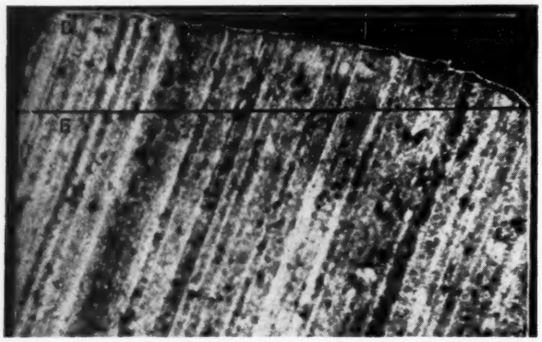


Fig. 4. Profile at Cut Edge of a Tear-Test Specimen Died-out of a GR-S Tread Stock with a Dull Die

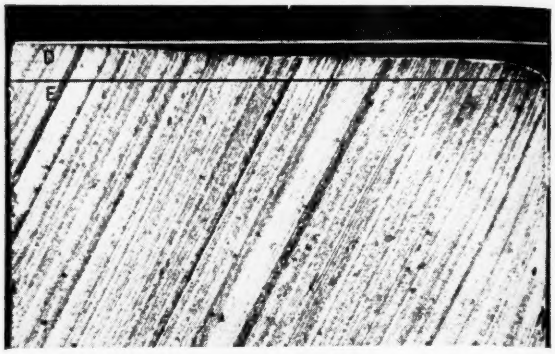


Fig. 5. Profile at Cut Edge of a Tear-Test Specimen Died-out of a Neoprene Mechanical Goods-Type Stock

line D to the line E in the figures, was determined. These values varied from 0.0012-inch for a GR-S tread stock submitted by laboratory A to 0.0161-inch for a GR-S tread stock submitted by laboratory B. The values obtained for the sections shown in Figures 2, 3, 4, and 5 are 0.0154- ,0.0087-, 0.0122-, and 0.0051-inch, respectively.

TABLE 1. MEASURED DEPARTURES OF THE CUT EDGE FROM A FLAT SURFACE PERPENDICULAR TO THE FACE OF THE TEST SHEET

Laboratory	Rubber	Type Stock	Average* Departure Inch	Direction of Cut with Reference to Grain
A	Natural	Pure gum	0.0034	—. .
	Natural	Mechanical	0.0073	. . . .
	GR-S	Tread	0.0020	. . . .
B	GR-I	Pure gum	0.0100	With
	GR-I	Pure gum	0.0125	Across
	GR-I	Mechanical	0.0123	With
	GR-I	Mechanical	0.0109	Across
	GR-S	Tread	0.0148	With
	GR-S	Tread	0.0150	Across
	Natural	Tread	0.0113	With
	Natural	Tread	0.0147	Across
	Natural	Pure gum	0.0078	With
	Natural	Pure gum	0.0100	Across
C	Natural	Tread	0.0028	. . . .
	Neoprene	Mechanical	0.0050	. . . .
	Neoprene	Conducting	0.0063	. . . .
	Neoprene	Tread	0.0032	. . . .
D	GR-S	Tread	0.0116 Die 1	. . . .
	GR-S	Tread	0.0057 Die 2	. . . .

*The average departure is the average value for the determinations of DE (shown in figures) for a given stock. The minimum number of determi nations was 3.

A summary of all the results obtained is given in Table 1. However, since it is not the intention here to make quantitative evaluations, these data are given merely as an indication of the variations which may exist and should not be taken as characteristic of the particular type of stock. While the type of stock will undoubtedly affect the profile of the cut edge, in the opinion of the authors the condition of the die and the care used in dieing out the specimens are undoubtedly of far greater importance. This point is borne out by the profile shown in Figure 4 in which the specimen is known to have been cut with a dull die. Also, it is known that a sharp die and care in dieing out the specimen will result in a profile similar to Figure 5.

Carbon Black Statistics, Third Quarter, 1948

Following are statistics for the production, shipments, producers' stocks, and exports of carbon black for the third quarter of 1948. Production, shipments, and inventory figures are compiled from reports made available to the United States Bureau of Mines by the National Gas Products Association, and by direct reports from producing companies whose operations are not covered by the Association. Export figures are reported by the U. S. Department of Commerce, but are not fully comparable in a given month because of the lapse of time between loading at producing plants and clearance for export.

(Thousands of Pounds)

	July	August	Sept.	First Nine Months, Total
Production:				
Contact types	55,973	55,402	55,189	502,427
Furnace types	48,211	48,194	49,347	467,525
TOTALS	104,184	103,596	104,536	969,952
Shipments:				
Contact types	53,247	57,105	54,093	495,896
Furnace types	47,561	49,738	46,736	440,456
TOTALS	100,808	106,843	100,829	936,352
Producers' Stocks, End of Month:				
Contact types	14,094	12,391	13,487	13,487
Furnace types	91,450	89,906	92,517	92,517
TOTALS	105,544	102,297	106,004	106,004
Exports, totals	24,376	21,809	25,843	234,703

SOURCE: Bureau of Mines, United States Department of the Interior, Washington, D. C.

EDITORIALS

Organized Labor's New Demands and Our National Economy

ORGANIZED labor has claimed that its support of President Truman and the Democratic Party was responsible for the President's election and the return of the control of Congress to the Democratic Party. Statements made at the national conventions of the Congress of Industrial Organizations and the American Federation of Labor during the latter part of November indicate that organized labor expects to be paid-off by more favorable legislation during 1949. Even though labor's "asking price" may differ from such payment when made, a record of some of these demands and a consideration of their possible effect on our national economy would seem to be of importance at this time.

Probably first and foremost among the demands of organized labor is the repeal of the Taft-Hartley Law and the immediate reenactment of the Wagner Act. We would like to point out, however, that between August, 1947, and August, 1948, the first year that the Taft-Hartley Law was in operation, work stoppages numbered 2,866 and involved 1,721,000 workers, according to the Bureau of Labor Statistics of the United States Department of Labor. These figures may be compared with those for 1945 and 1946 when 4,750 work stoppages involved 3,470,000 workers and 4,985 stoppages involving 4,600,000 workers, respectively, occurred.

Some of the leaders of organized labor apparently also feel that complete repeal of the present law and return to the Wagner Act is not the best answer. In a statement before the AFL's convention, Joseph D. Keenan, director of that union's League for Political Education, said:

"We believe the Taft-Hartley Law went too far against organized labor, but we might as well admit that the Wagner Act went too far in our favor."

A resolution passed by the delegates at the AFL convention, therefore, said in part:

"After the Wagner Act is restored, we will be ready to consider any amendment that may be desirable to improve this Act and to strengthen collective bargaining procedures."

The CIO indicated in August, 1947, that its first objective was the repeal of the Taft-Hartley Law and the reenactment of the Wagner Act.

The president of the CIO, Philip Murray, in his annual report on the eve of the union's November convention asked for the further enactment of an eight-point national economic program. Included in this program would be the establishment of price controls, an excess-profits tax, a minimum wage of $1 an hour, allocation of essential materials, and low-cost public housing.

Inflation and high prices in the United States have been attributed to our increased money in circulation and to a still-continuing scarcity of certain goods because of the needs of the defense and world recovery programs. Attempts to control and reduce prices by law in the recent past have resulted in a reduction in the volume of goods available to the consumer. Money in circulation is likely to remain high as long as huge sums are necessary for foreign aid and our national rearmament program. What is needed in order to prevent further price increases and eventually reduce prices is the production of more goods per worker and without any further increase in unit labor costs.

It goes without saying that if labor foregoes another round of wage increases, business must avoid any further price increases for its products. As was pointed out in this column last August, the objectives of both labor and management should be directed toward lower costs and lower prices if we are to profit from the lessons learned in industrial progress in this country during the past several decades.

The return of the wartime excess profits tax would also be liable to reduce rather than increase the volume of goods available to the consumer since it would remove almost all of the profit incentive to business. At the same time no funds for modernization and expansion of plants necessary to improve output per worker and reduce unit costs would remain available to management.

A minimum wage of $1 an hour is in the same category as another round of wage increases. Additional labor costs will require price increases, which in turn will lead to demands for more wage increases. It is hard to see how a continuation of this vicious circle can do anything but harm to our national economy.

It is evident that Mr. Murray senses the basic difficulty with regard to the present and future economic situation in the United States when he contends that it is essential that his program be developed during a period in which government outlays for armaments and defense, plus continued expenditures for the European Recovery Program, are serving as "temporary props that keep our economy operating."

"We must be in a position," he added, "to maintain a full-employment-and-full-production economy when these temporary props no longer exist."

It is our belief that these "temporary props" cannot be adequately or properly replaced by a huge program of national socialism, but that they must be replaced, when necessary, by a steadily increasing volume of foreign trade. The capacity for industrial production in the United States has expanded considerably beyond the ability of the domestic market to absorb all of that production. When the time comes that we do not need this excess industrial capacity for armament and world recovery, we will need to be able to do a large amount of exporting of goods and services, or we may not continue a "full-employment-and-full production economy."

With existing high price and wage levels in this country, our attempts to increase foreign trade may meet with some difficulty. The leaders of business and of organized labor might do well to give serious consideration to this situation.

DEPARTMENT OF
PLASTICS TECHNOLOGY

Evaluation of Thermoset Laminated Sheet Products[1]

F. L. Minnear[2]

THE evaluation of thermoset laminated sheet products is a subject that ties together the first 10 years of my industrial experience in high-pressure laminating with the last four years in contact pressure laminating. The scope of this paper is a comparison of the two processes and their products.

History of Laminating Processes

The histories of the two laminating processes are quite unlike. Phenolic laminates, the first high pressure laminates, were initially manufactured in 1914. Westinghouse Electric Corp.'s Micarta was followed shortly by Formica Insulation Co.'s Formica and General Electric Co.'s Textolite. Today there are some two dozen manufacturers of phenolic laminates in the United States alone. I do not know the exact tonnage or capacity of phenolic laminate production, but its total runs well over 50,000,000 pounds a year.

At first the emphasis was upon industrial applications; the entire output of phenolic laminates went into electrical and mechanical uses. The Spaulding Fibre Co. was the first to manufacture phenolic laminates for decorative purposes. These were dark wood-grain patterns used as instrument panels in radios. It will be remembered that the first radios had to have a Bakelite front panel. Since 1930 a very substantial part of the output of phenolic laminates has been used in applications where decorative value is one of the prime functions.

Contact pressure laminates have been manufactured since 1943, and by the continuous method since the Fall of 1944. There are now eight or nine companies equipped to produce these laminates continuously. I believe it may be safely said that not one of these machines is producing today at full capacity.

During the last 12 months of the war, which was the first year of production on continuous machines, woven Fiberglas and cotton duck laminates were made for use in warplane construction. On V-J Day these war contracts were cancelled immediately, and the new-born industry was left with equipment, materials, and technique, but with no orders. Ever since that time there has been a struggle to find peacetime applications suitable to the process.

Chemistry of the Processes

The chemistries of high-pressure and contact laminating processes are based upon quite different reactions. The binder for phenolic laminates is the resinous condensation product derived from the reaction of phenol and formaldehyde, or their homologs. In order to obtain the best characteristics in the completely cured resin and to avoid escape of gaseous products of the condensation reaction, great pressure is required during the molding operation. The reaction is irreversible, as is that of contact laminating.

The binder for contact pressure laminates is frequently termed a polyester resin. More specifically, it is a copolymer of a vinyl compound, such as styrene, with an unsaturated alkyd made from a glycol and dibasic acids, a substantial ratio of the latter material contains the double bond. In the presence of a peroxide catalyst active copolymerization takes place upon heating to yield the final thermoset resin. The reaction is exothermic, but no gaseous by-products are evolved, and, therefore, no pressure is required to obtain the best characteristics in the cured resin.

Laminating Processes

Since the chemistries of the two plastic resins are quite different, it is not surprising that the methods used in making the laminated sheets are also different.

Phenolic laminates are made in two principal steps, the latter of which is of necessity a batch operation. Webs of paper, woven cloth, etc., are impregnated with a solution of semi-cured phenolic resin. The drying operation evaporates the solvent and further partially cures the resin particles dispersed in and around the fibers of the reinforcing material. Modifications of this step are in use, but the majority of phenolic laminators still impregnate at least some of the filler in this manner.

After the treated material is cut into sheets, the lay-up is assembled between metal plates and placed in the openings of a hydraulic multi-platen press. Under a pressure of 1,000 p.s.i. or more and at a temperature of about 325° F., the resin first melts and then solidifies, binding all the layers together into one composite board. While yet under pressure, the laminates are usually cooled before removal from the press, then disassembled, and their ragged edges trimmed off by sawing.

This process was the one practiced at the beginning and is essentially the same process in use today. The most notable modifications which have been made are as follows:

(1) Use of melamine-formaldehyde resin-treated paper for outer surfaces of laminates to obtain greater surface hardness, higher heat resistance, reduced electrical tracking, and/or to obtain lightfast pastel colors in decorative laminates. A substantial amount of all-melamine laminates are now also being made.

(2) During the war resins and paper were developed for molding under reduced pressures in order to utilize wood-veneering processes. Low-pressure phenolic laminates were thus developed. Molding pressures of approximately 50-400 p.s.i. were used. The product in many cases resembles the high-pressure laminate, but has somewhat inferior electrical, water resistance, and other properties, except strength.

(3) Phenolic-treated paper has been molded directly to the surface wood, and even thin layers of wood have been impregnated and used as the surface layer. Other new reinforcing fillers, such as Fiberglas, have also been used.

In addition to these three innovations, harder metal surfacing plates are being used to avoid dents and scratches, and the hydraulic presses are somewhat larger.

The phenolic laminating industry has been fairly well satisfied with its products. These products must have been good for they have been sold in increasing quantities during their 33 years of existence.

Contact pressure laminates are made in one continuous operation. Webs of paper, woven cloth, etc., are impregnated with the activated liquid polyester resin mixture, brought together between surfacing webs of cellophane or other separator, pressed in the nip of a pair of combining rolls, and carried continuously through a curing oven. The cured laminate is cut into any design length, or even wound into rolls. It sounds quite simple.

Comparison of the Processes

All processes and products have their strong points and, conversely, certain weaknesses. In an effort to bring out the differences and comparisons of these two processes and the products made therefrom, I shall present my conception of some of the advantages and disadvantages of each process.

Phenolic laminates are made by a batch process, and several separate labor-requiring handlings of materials are involved, such as impregnating the reinforcing filler, cutting the treated sheets to size, weighing and stacking the treated sheets between the surfacing plates, loading and unloading the press, disassembling the finished laminates, and trimming. All of these operations require labor and careful quality control, but the process has the advantage of being able to fill a variety of small orders. One sheet of a special thickness or lay-up can be made with a press load of other laminates provided its area is approximately the same. The sheets of treated filler can also be laid up alternately at right angles so that the strength of the laminate will be the same both lengthwise and crosswise. This practice is especially simple to do with square sheets.

Phenolic resins cure to a dark brown color so that only dark-colored laminates, such as browns and blacks, are possible. To overcome this handicap surfacing sheets of melamine-treated filler are applied to give decorative pastel shades. The product cannot be made transparent, however, although an all-melamine laminate may be made translucent.

[1] Presented before Low-Pressure Industries Division, Society of the Plastics Industry, Inc., Chicago, Ill, Jan. 16, 1948.

[2] Director of plastic research and development, Shellmar Products Corp., Mt. Vernon, O.

One of the problems in the phenolic laminate industry has always been that of making perfectly flat sheets free from warping or bowing. In the making of melamine-surfaced phenolic laminates this problem is still further aggravated.

The cost of phenolic resins used in making laminated sheets is around 20¢ a pound, very nearly a rock-bottom price. A few cents should be added to arrive at the cost of the resin put into the treated filler, but even then the cost is relatively low. The treated sheets contain from 35-40% dry resin, by weight, in the inner layers, and from 50-60% resin in the surfacing layers for the XX paper-base grade. Assuming that the cost of the paper, cloth, and other fillers is the same for both processes, the purely phenolic laminates have a lower cost for their raw materials to offset their higher labor costs.

Melamine resin costs about 50¢ a pound so that laminates containing this resin are relatively high in cost. Thus it costs nearly as much to make a 1/32-inch thick melamine-surfaced phenolic laminate as it does to make a 1/16-inch thickness, because the saving in thickness is obtained by using fewer of the less expensive phenolic-treated layers. For the thinner thicknesses, therefore, the melamine-surfaced phenolic laminates have a high raw material cost in addition to high labor cost when compared with contact pressure decorative laminates.

Phenolic laminates can be made in almost any thickness. The only handicap here is the greater period of time needed for curing the thicker laminates. The bulk of decorative applications, however, calls for sheets 1/16-inch thick.

Phenolic laminates and those containing melamine resin are hard, rigid, brittle, and cannot be made flexible. This condition is satisfactory when the application calls for such a sheet, but is a distinct disadvantage in a host of applications where it is desirable to use a more flexible thermoset material. Machining, punching, shearing, sawing, routing, and losses due to chipping and damage in shipping have always been problems in the industry.

In spite of these limitations there are enough advantages in the process and products made by high-pressure (and so-called low-pressure) laminating to make it a going industry, firmly entrenched, with continued good prospects for the future. Its products are good and, when used in the right places, give excellent service.

Contact pressure laminates are made by a continuous process; this has self-evident advantages and disadvantages. As in other well-designed continuous processes, the cost of labor in the conversion of raw materials to finished product is relatively low. Once the process is set up right, quality control, uniformity of manufacture, supervision, and inspection on the machine are relatively simple. This is not to deny that good technical supervision and research are needed, for they are, particularly in so new an industry. However, where long runs of any one grade of product are made, the continuous process certainly has advantages.

This brings us to the greatest present disadvantage of the continuous contact pressure laminating process: short runs are a headache. In this new process making new products, in most cases for new applications, the volume of business has not yet been large enough to take full advantage of the possibilities inherent in the process. The make-ready time, clean-up time, and loss of catalyzed resin at the end of a short run are practically the same as for a long run, and the cost figures reflect this fact. It is, therefore, the aim of all manufacturers in this field to find those applications for which products can be made and sold in large volume. Progress so far has been "two steps forward and one step backward."

The nature of the contact pressure process makes it virtually impossible to "cross-laminate" the treated fillers, but this is circumvented, when necessary, by obtaining fillers which are of approximately equal strength both lengthwise and crosswise.

Polyester resins cure to a transparent, almost colorless solid, and there is no difficulty in obtaining any decorative color or shade. Any design that can be printed is possible, and even a high degree of translucency is obtainable. When opacity is desired, it can be obtained by incorporating opaque pigments in the fillers or in the resin.

Because the contact pressure laminate is cured without pressure and strains are not set up within the board, practically no warping or bowing of the laminate is experienced provided a balanced lay-up is specified, i.e., a lay-up in which the top half of the laminate is made like the bottom half.

The cost of polyester resins used in making contact pressure laminates is approximately 40¢ a pound. Some suppliers estimate that the cost could drop to around 30¢ a pound if increased volume could be used to reduce their costs. The cost of polyester resins, therefore, is between that of the phenolics and the melamines.

The resin content of the treated fillers varies from about 45%, by weight, for woven Fiberglas cloth to about 65% for highly saturable paper. The economics in this comparison favor the phenolic laminators, although the gap narrows when thin laminates are compared. Since the cost of the resin is a major item of expense, the contact pressure laminators look forward hopefully for every possible price reduction. The price for polyester resins only four years ago was $1.05 a pound; so this hope is not an idle dream.

In some applications it is desirable to have the properties of the filler predominate; in others it is of advantage to increase the resin content in order to obtain more of the resin properties. For example, increased resin content improves the dimensional stability of the product, lowers the water absorption values, improves the electrical properties, and benefits the properties of flexible laminates.

Although polyester resin laminates can be made over one inch in thickness, the continuous process, as now performed does not lend itself well to making thicknesses greater than about 1/10-inch. There are two principal reasons for this limitation: (1) the slow speed of curing; thinner sheets dissipate much more rapidly the exothermic heat generated during the polymerization reaction; and (2) the weight of the webs in thicknesses over ⅛-inch may cause sagging of the laminate during the curing operation, resulting in a bowed sheet. Thicknesses of 1/16-down to 0.005-inch are ideal for the continuous contact pressure laminating process. The thinner the product, the faster the curing speed and the less the manufacturing problems involved.

One of the greatest advantages of laminating with polyester resins is that almost any degree of flexibility or rigidity can be made, from the very hard and rigid sheets to the very pliable and flexible. Little or no differences in the other general properties of the product are experienced. This point opens up entirely new fields for thermoset laminates, and the phenolic laminators will be the first to appreciate this fact. There are numerous applications calling for a semi-flexible, decorative, thermoset, relatively thin laminate. To name a few: wall covering, especially for bathrooms, and kitchen sink counter covering to replace linoleum, which is admittedly inadequate when installed in the home.

Similarities of the Processes

So far I have been emphasizing the differences between phenolic and contact pressure laminates. We should recognize, however, that a large number of properties are common to both, especially when the rigid types are compared.

There has been criticism of the contact pressure laminating industry that standards have not been set up and that there is not enough engineering data on the physical, electrical, and chemical properties of their products, such as the National Electrical Manufacturers Association has for the phenolic laminating industry. This point we admit to be true, but our alibi is that this is yet a new industry. The N.E.M.A. was not organized until 10 years after the phenolic laminating industry was established.

Several standard grades of phenolic laminates exist. The contact pressure laminates are not yet well standardized, but even more grades are possible. This condition is so because of the flexibility variations that can be introduced in contact pressure laminates. Comparisons of the two types of laminates, therefore, should be made in a very general way.

To the layman there is great similarity in the appearance of the two laminates. In fact, a sheet could be made by each process so that even the expert would have to look twice before he could distinguish between the two. Both types are thermoset laminates, and both have great strength. This strength is primarily a function of the filler. The tensile and impact strengths of Fiberglas laminates perhaps favor the contact pressure method because there is much less danger of breaking the glass fibers in this process.

The resistance to splitting is the weakest strength factor of both laminates. Both laminates are difficult to glue and require special adhesives or roughened surfaces. Both have excellent electrical properties and comparable thermal insulating values. Both can be made fire-resisting, although melamine resins are better in this respect than either the phenolics or the polyesters. The specific gravities of the two laminates are very close, and both have good chemical resistance and very low organic liquid absorption rates.

The water absorption values for both phenolic and polyester laminates are low. Only in the paper-base laminates do the phenolics show a slight advantage. This is probably due to the smaller molecule size of the phenolic resins and hence better impregnation of the paper fibers, but research now in progress has shown that the water resistance of contact pressure paper-base laminates can be made as good as that of the phenolics.

As previously stated, both types of laminates can be made for decorative applications, but only the contact pressure laminates can be made transparent. Both laminates can be made with glossy or mat surfaces. Both have slight characteristic odors. When polyesters are freshly made, their odor is more noticeable, but the odor of the phenolics is more permanent. There

are grades of each type which are almost completely odorless. Besides both laminates can be post-formed, within limits, to irregular shapes such as simple curvatures and angles.

Summary and Conclusions

In conclusion, the main advantages of contact pressure laminates over phenolic laminates, as we have seen, are as follows:

(1) A wide range of flexibilities from the very rigid to the very flexible.

(2) The water-white color of the resin which makes possible the production of any decorative color, both plain or with designs, from black to pastel shades, either opaque or translucent. These can be made economically in thicknesses down to 0.005-inch.

(3) Maximum strength in Fiberglas laminates.

(4) Continuous production of laminates in any length of sheet or roll.

The contact pressure laminating process, therefore, is capable of producing a very wide range of products and makes it possible, furthermore, to tailor-make laminates to fit the requirements of many applications.

I believe that the continuous process of making contact pressure laminates has enough advantages for it to carve out its own field. It will do so on its own merits. That there will be instances when it will overlap into some applications of phenolic laminates is likely, just as it will compete with wood, metal, and linoleum for some uses. Statements, however, that it will displace any of these materials, as has been unfortunately claimed by some promoters in this field, are just plain silly. Likewise, the advantages of phenolic laminates are numerous, and it is my opinion that the future will see these two processes complementing each other rather than competing with each other.

SPE Technical Conference; Sections Hold Monthly Meetings

THE Society of Plastics Engineers will hold its annual National Technical Conference on January 19 to 21 at the Bellevue-Stratford Hotel, Philadelphia, Pa., it was announced by the national president, J. H. DuBois, Shaw Insulator Co. The Conference will feature technical sessions each day, a combined luncheon and annual meeting on January 20, and a meeting on January 19 of the Society's national directors to formulate policies and elect officers for 1949. Surrounding the meeting rooms will be a group of small booths to be used as conference rooms. Technical representatives of the various suppliers to the plastics industry have been invited to take over these spaces for consultation purposes with members attending the Conference. A limited number of small exhibit spaces will also be available for display purposes.

The tentative program of technical papers for presentation at the Conference has been announced by Russell B. Aiken, of Goodyear Tire & Rubber Co. and chairman of the speakers committee, as follows: "Quartermaster Research Program on Plastic Films and Coated Fabrics," W. A. Stubblebine, Office of the Quartermaster General, United States Army; "Flame Resistant Cellulose Acetate Molding Powder," B. E. Cash, Celanese Corp. of America; "Choice and Treatment of Steels for Mold Making," Peter Payson, Crucible Steel Co. of America; "Silicones as Mold Release Agents for Hot Mold Parts," W. A. Wiard, Dow Corning Corp.; "Sapphire Polishing Compounds for Plastic Molds," R. F. Waindle, Elgin National Watch Co.; "New Geon Molding Compositions," G. A. Fowles, B. F. Goodrich Chemical Co.; "Tuflite," L. B. Sebrell, Goodyear Tire & Rubber Co.; "Cel-F, Monochlorotrifluoroethylene Molding Compound," L. C. Rubin, M. W. Kellogg Co.

Also, "New Testing Procedures Being Developed for Plastics," A. G. H. Dietz, Massachusetts Institute of Technology; "Plasticizers," J. K. Craver, Monsanto Chemical Co.; "Trouble Shooting on Compression Molding Problems," M. J. Petretti, Noma Electric Corp.; "Plaskon 420—New-Type Thermosetting Molding Powder," M. H. Bigelow, Plaskon Division, Libbey-Owens-Ford Glass Co.; "Princeton's Graduate Engineering Program in Plastics and Some Aspects of the Army-Navy Research Program on Plastics," L. F. Rahm, Princeton University; "Satusply—A New Plastic Wall Surfacing Material," R. M. Paulsen, United States Rubber Co.; "Design of Hydraulic Equipment and Recent Advances in Hydraulic Control," Richard Dinzl, Watson-Stillman Co.; and "Future of Plastic Films," M. R. Gerow and R. G. Kadesch, Reynolds Metals Co.

Electronic Preheating and Heat Sealing Equipment

The Western New England Section held a regular dinner-meeting on November 3 at the Hotel Sheraton, Springfield, Mass. W. T. LaRose, of W. T. LaRose & Associates, Inc., had been scheduled to speak on electronic preheating and heat sealing equipment for the plastics industry, but was unable to appear. The talk, however, was given by Robert Stokes, sales manager, and Pat Moran, technical service representative, of the company.

The speakers began with a demonstration of the Thermal Super Hornet preheater, a small-size, lightweight unit that can preheat up to 10 ounces of material in 60 seconds. Mr. Moran said that preheaters of this type are available in various sizes for different applications and can reduce molding time by 50% or more, thereby reducing the number of molds necessary for producing any given item. For jobs requiring the preheating of preforms for multiple-cavity dies, the company manufactures loading board preheaters which can heat up to five pounds of material to 270° F. in 60 seconds. Preform loading is generally recommended over powder loading when high-frequency preheating is to be used because of ease of handling and the fact that preforms heat up more rapidly than do powders.

Mr. Stokes also noted that although high-frequency preheating is commonly used in conjunction with thermosetting materials, it may also be employed for thermoplastic materials with the possible exception of polystyrene and acrylic plastics. The only problem in preheating thermoplastics is the dissipation of the moisture globules formed on the upper electrodes, and several methods have been developed to solve this problem.

The speakers also demonstrated their company's electronic heat sealing unit which can be used for acetate and polyethylene boxes of various types. Sealing time for a four-inch acetate box, up to 20 gage in thickness, is only ¼-second, and acetate box manufacturers can produce up to 35 such boxes per minute by use of this unit.

Responsibility for Mold Design

Approximately 130 members and guests of the Newark Section attended a dinner-meeting on November 10 at the Newark Athletic Club, Newark, N. J. "Responsibility for the Design of Molds" was the meeting topic, with C. M. Coe, Shaw Insulator Co., presenting the viewpoint of the molder, and Eric Gronemeyer, Sameric Engineering Co., discussing the viewpoint of the designer.

Since mold design is of primary importance in the making of a plastic part, responsibility for mold design must be established, Mr. Coe declared. There are certain definite steps in the design of a mold, as follows: (1) the customer presents the fundamental requirements and idea for a plastic product; (2) the designer styles the part; (3) the engineer and draftsman interpret the style into an engineering drawing of the mold; (4) the drawing should be referred to the molder for his comments and suggestions as to mold design, materials, etc.; (5) the mold maker manufactures the mold; (6) the mold is used to make sample parts for inspection; and (7) the mold is used for commercial production. Mr. Coe emphasized that this procedure is the recommended one and involves the cooperation of customer, designer, engineer, molder, and mold maker. This cooperation does not mean divided responsibility, however, and the speaker stated that final responsibility for mold design must rest with the molder.

In presenting the designer's viewpoint, Mr. Gronemeyer differentiated between the practical product designer and the visionary or stylistic designer. The former must know materials, molds, and molding production and, as such, is well qualified to assume responsibility for mold design. Both speakers illustrated their talks with case histories, and the interest aroused was such as to provoke a long and spirited discussion involving almost everyone in attendance.

Section President James T. Growley, Celanese Corp. of America, announced that the nominating committee, chairmaned by Islyn Thomas, Thomas Engineering Co., had selected the following six candidates for election to the three vacancies on the Section's board of directors: Gene Fortney and Roland Frackenpohl, both of Newark Die Co.; John Grossbach, American Hard Rubber Co.; Gilbert Meyers, General Electric Co.; Ed Rowan, Dillon-Beck Mfg. Co.; and Peter Simmons, Dow Chemical Co. Mr. Growley also announced that Mr. Thomas had been elected the Section's representative on the SPE national board of directors.

Narcus before New York Section

A talk on "Metal Plating on Plastics," by Harold Narcus, president and research director of Electrochemical Industries, Inc., featured the November 9 dinner-meeting of the New York Section, SPE. Attended by approximately 43 members and guests, the meeting took place at the Hotel Sheraton, New York, N. Y., and was presided over by Section President Arthur Nufer, Bakelite Corp.

Dr. Narcus began his talk with a discussion of the advantages of plated plas-

tics as compared with unplated plastics. Experiments show a marked increase in tensile, impact, and flexural strengths for many plated plastics, an appreciable increase in heat distortion temperature, and also a decrease in water absorption of the plastic when completely enveloped in a metal plating. An additional advantage is that a metal-on-plastic plating does not show a galvanic couple and is therefore more corrosion resistant than a metal-on-metal plating. The two main purposes for metal plating a plastic are to render the plastic a suitable substitute for critical or strategic metals, and to produce a product which has the inherent properties of the plastic in addition to the desired properties of the plated metal.

For plating on plastics, methods employing metal powders in a lacquer or varnish medium, metal spraying, cathode sputtering, and metal evaporation can be used but have not proved themselves satisfactory for production work. Such commercial operations can best be accomplished by electrodeposition. This method involves the application to the plastic surface, after proper preparatory treatment, of a conductive and adherent bond coat by using a solution of ammoniacal silver nitrate and a suitable reducing agent, followed by an intermediate layer of electrodeposited copper or silver, and finally a top layer of the desired metal plating. Dr. Narcus also described his company's new Cupron process, which employs a copper sulfate solution and deposits a copper film in place of the silver bond coat. This copper process is cheaper than the silver method and gives films having greater bond strengths.

The speaker emphasized that the preparatory treatment of the plastic surface is the major factor in obtaining a satisfactory metal plating and consists of "de-glazing" or roughening the surface followed by thorough cleansing. The thickness of the chemically precipitated silver or copper bond film can be measured quantitatively by either the weight or optical methods. Dr. Narcus' talk, illustrated with slides and samples of metal plated plastic parts, was followed by a lively discussion period.

In the business session preceding the technical paper Mr. Nufer announced the selection of the following candidates for the three vacancies on the Section's board of directors: George Baron, Ideal Plastics Corp.; Nicholas Fasano, Washington Molding Co., Inc.; Palmer Humphry, consultant; Leon Lautin, Quality Plastic Co., Inc.; Ed Walsh, Tech-Art Plastics Co.; and Bruno Wessinger, Wess Tool & Die Co. The new directors will be elected by a letter ballot of the membership and will meet with the full board of directors prior to the Section's December meeting to elect new officers for the group, who will be installed at the December 14 meeting.

Joint Meeting on Extrusion Molding

A round table discussion on "Recent Developments in Extrusion Molding" featured the November 4 joint meeting of the Southern California Section, SPE, and Pacific Coast Section, SPI, held in Los Angeles, Calif. R. E. Bitter, B. F. Goodrich Chemical Co., Clint Booth, Glen H. Taylor Co., Walter Kadlec, E. I. du Pont de Nemours & Co., Inc., and R. G. Kress, Extruders, Inc., took part in the discussion at the meeting, which was attended by some 50 members and guests of the two sections.

Mr. Bitter gave a brief history of the polyvinyl chloride resins and described their properties and fundamental compounding principles. Mr. Kadlec mentioned some of the more important applications for Polythene, such as food packaging and electrical insulation, and showed how these uses resulted from the properties of the material. He noted that polyethylene extrusion is possible at temperatures ranging from 350 to 500° F.

Mr. Kress spoke on the need of producers of both materials and equipment to obtain more information on the best methods for getting out production using their materials and machines. In this respect, the speaker emphasized the need of accurate control of temperature and screw speed in extrusion. Mr. Booth, whose company represents the Plax Corp., described some of the new Plax developments, including polyethylene bottles, extruded polystyrene sheet of 0.001-0.025-inch thickness, grainless polyethylene sheeting 0.001-0.080-inch thick, methacrylate sheet, Lay-Flat polyethylene sheet and acetate film, and annealed polystyrene rod.

Cleveland-Akron Meetings

The Cleveland-Akron Section, held a regular dinner-meeting on October 29 at Brown's Cottage Restaurant, Cleveland, O. Feature of the evening was a talk on "Engineering Plastics for Artificial Limbs" by Clare L. Milton, Jr., of the Engineering Division, Army-Navy Medical Procurement Office, Fort Totten.

Mr. Milton described the work of the Army Medical Center in developing prosthetic devices made of plastics. His topic was not only of great human interest, but also contained valuable technical information on fabric-plastic laminates and slush molding of vinyl plastisols. Of particular interest was the discussion of methods of constructing molds by use of alginates, plaster, and electroforming operations. Numerous samples of prosthetic devices, of often startling realism, were used to illustrate the talk.

A talk on "Dimensional Stability of Cellulosic Plastics and Synthetic Resins," by W. O. Bracken, Hercules Powder Co., featured the November 19 meeting of the Cleveland-Akron Section, SPE, at Brown's Cottage Restaurant. This talk was illustrated with slides and contained much information on the effects of varying molding techniques and other processing conditions. A detailed comparison of the principal properties of molded cellulose acetate with other plastic materials was also included.

In the business session preceding the talk, it was announced that Richard L. Huber, also of Hercules, has been appointed a member of the Section's board of directors. Instead of the regular meeting, the group will hold a buffet supper and dance on December 17 at the Cleveland Club, Tudor Arms, Cleveland. The next regular meeting, scheduled for January 28 in Akron, will feature a talk on "Engineering Aspects of Adhesives" by Fred Wehmer, Minnesota Mining & Mfg. Co.

Molding Thermosetting Materials

The first meeting of the new season for the Philadelphia Section, SPE, took place on October 19 at the Franklin Institute, Philadelphia, Pa. Guest speaker was E. W. Vaill, technical representative, Bakelite Corp., whose topic was "Practical Application of the Theoretical Aspects of the Closed-Mold Method of Molding Thermosetting Materials." Mr. Vaill's talk, covering the variables in the closed-mold method, was identical with the paper of the same title by C. A. Norris, also of Bakelite, published in our July issue.

An innovation from the usual meeting program was an auction of numerous valuable plastics items, including a television lens, desk set, radio, and other products.

Plastics and Varnish

A regular dinner-meeting of the Buffalo Section, SPE, was held October 15 at the Park Lane Restaurant, Buffalo, N. Y., with approximately 30 members and guests attending. Featured speaker was Otto J. Schultes, in charge of varnish research and control at Pratt & Lambert, Inc., who discussed "Plastics and Varnish Manufacture." Mr. Schultes reviewed the changes through the years in varnish formulations for protective coatings and discussed the improvements in modern coatings, from both the chemical and practical viewpoints, obtained by use of plastic resins.

Clinwill Plastics, Inc., displayed a number of products fabricated or drawn from acetate and acrylic sheet; while Bill Glass, company president, outlined the manufacturing operations used for several of these products. Ralph Wolf, Spaulding Fibre Co., Inc., spoke briefly, outlining his work in developing special test methods for laminated materials.

The group's next meeting, on November 19, consisted of a dinner at the Delaware Grill, Tonawanda, followed by a tour of the Taber Instrument Corp. plant at North Tonawanda. It was also announced that the Section will hold its annual Christmas party in conjunction with Ladies' Night on December 17.

Plastics from Coal

Some 130 members and guests of the two societies attended a joint meeting of the Chicago Sections of SPE and SPI on November 10 at the Builder's Club. Featured speaker was George D. Bieber, Midwest district sales manager, Koppers Co., Inc., who discussed "Plastics from Coal."

Mr. Bieber described the use of raw materials obtained from coal as starting materials in the manufacture of many of the plastics now in commercial production and noted the important role which these raw materials play in the development of new plastics for special uses. The speaker also reviewed the general classes of plastics made from coal derived chemicals and described the use of these chemicals in the production of each plastic.

Akin Addresses Rochester Section

Approximately 45 members and guests of the Rochester Section, SPE, attended a dinner-meeting November 16 at the regular meeting place, Lorenzo's Restaurant. Featured speaker was R. B. Akin, E. I. du Pont de Nemours & Co., Inc., who discussed "Injection Molding of Nylon and Polythene." Dr. Akin described the procedures for injection molding nylon and polyethylene and the solutions to problems arising in production. The talk was illustrated with slides and a large number of sample injection molded parts.

California Section Meets

THE Southern California Chapter, Society of the Plastics Industry, held a dinner-meeting November 18 at Scully's Cafe, Los Angeles. Approximately 49 members and guests attended the meeting, presided over by Elmer Huling, Wilcox Plastics Co. In the business session, Bart

(*Continued on page* 358)

Scientific and Technical Activities

Diversified Program and Election of Officers Feature Detroit Rubber Division Meeting

H. I. Cramer—Chairman

THE fall meeting of the Division of Rubber Chemistry, American Chemical Society, was held at the Hotel Book-Cadillac, Detroit, Mich., November 8, 9, and 10, and an unusually diversified program of papers, the election of new officers and directors, another luncheon meeting of the 25-Year Club, and the Divisional banquet attracted a registration of about 700 members and guests. Chairman Harry E. Outcault, in his opening remarks at the first technical session on the afternoon of November 8, emphasized that the success of meetings of the Division depends to a considerable degree on the papers given by the members and mentioned that because of the greater than usual degree of diversification of the papers at this meeting, it was not possible to group them according to type for any of the four sessions. Apparently the wide range of subjects discussed was of more than usual interest since attendance at the technical sessions was at a high level.

The luncheon meeting of the 25-Year Club on November 8 was also well attended with 108 members present, and this affair has now become a regular part of Division programs. Besides an announcement of the results of the letter balloting for officers and directors for 1949, the business meeting of the Division on November 9 included a report of the membership committee, an announcement of the appointment of representatives of the Division on the council of the A. C. S., a further report on the library project of the Division, information of the next volume of the biennial "Bibliography of Rubber Literature," information on the book, "Synthetic Elastomers," being prepared, a report on a new policy of the Division with respect to participation in the high polymer forum activity of the Society, and reports on other items of interest to the members.

The banquet, held on the evening of November 9, was a most successful affair. The members and guests were honored in having as their special guest J. P. Keller, president of Chrysler Corp.

The 25-Year Club Luncheon

The luncheon of the 25-Year Club was presided over by W. G. Nelson, United States Rubber Co., and this gathering of the "old-timers" was enlivened by remarks from H. A. Winkelmann, Dryden Rubber Division, Sheller Mfg. Corp., past chairman of the Club; Division Chairman Outcault; and R. P. Dinsmore, Goodyear Tire & Rubber Co.

Recognition was accorded several of the members whose association with the rubber industry is much more than 25 years, and these members included W. Higgins, United Carbon Co., "Class of 1902"; C. R. Haynes, Binney & Smith Co.; and H. Fuller, Pequanoc Rubber Co., "Class of 1904"; and B. Henderson, American Cyanamid Co., "Class of 1906." It was stated that beginning with the next meeting of the Club, welcoming of the "incoming class" will be a regular part of the program of the Club.

B. R. Silver, New Jersey Zinc Co., chairman of the eligibility committee, reported that even though the 25-Year Club was organized within the organization of the Rubber Division, any qualified person who had been associated with the rubber industry for 25 years or more and who now is a member of the Rubber Division, could become a member of the Club.

N. Shepard, American Cyanamid, reporting for W. O. Hamister, Naugatuck Chemical Division, U. S. Rubber, chairman of the committee formed to obtain approval from the Rubber Division and the American Chemical Society for the Club and to decide on its name, stated that such approval had been granted, and that the name "25-Year Club of the Rubber Division of the A. C. S.," shortened to "The 25-Year Club," had been decided upon.

F. S. Malm, Bell Telephone Laboratories, reporting for E. B. Curtis, R. T. Vanderbilt Co., chairman of the nominating committee, announced that J. M. Bierer, Boston Woven Hose & Rubber Co., was the selection for chairman of the next meeting of The 25-Year Club, to be held in Boston, Mass., May, 1949, as part of the Division meeting.

The Technical Sessions

As a part of the ceremonies in connection with the start of the Detroit meeting, Chairman Outcault asked the members to stand in honor of Division members who had passed away during the course of the year. The names of these members, as read, follows: Ernest H. Blaker, Arthur E. Barnard, Wendell E. Bacon, Donald F. Cranor, Robert E. Clayton, Harvey J. Elwell, Henry Green, Leslie B. Gordon, Curtis J. Harwick, Herbert C. Kemble, Earle W. McMullen, and Alex E. Webb.

The chairman of the local committee on arrangements, C. W. Selheimer, Illinois Institute of Technology, next welcomed the members to Detroit and repeated the details of some of the plans with regard to housing, the banquet, etc., that had been made for those present at the meeting.

Abstracts of the papers given at the Detroit meeting appeared on pages 222-25 of the November issue of India Rubber World, but some further comment on several of these papers is necessary.

An accelerator-retarder combination consisting of mixed aliphatic thiazyl disulfides and n-nitroso diphenylamine for use with new reinforcing furnace blacks in natural rubber tire treads was described by W. H. Heinlen, Jr., of B. F. Goodrich Chemical Co.

By careful blending of polymers and types of carbon black, special attention to carbon black-plasticizer ratio, and the proper order of addition of materials to the rubber on the mixing mill, the higher power consumption requirements of some synthetic rubbers and particularly the new low-temperature GR-S can be substantially reduced, according to A. H. Nellen, W. B. Dunlap, Jr., and C. J. Glaser, Jr., of the Lee Tire & Rubber Corp. Most difficulty has been experienced at the tread tuber, it was said.

Three papers on rubber reclaiming were heard on the program for the morning of

J. E. Waters—New York

D. C. Maddy—Los Angeles

F. L. Holbrook—Conn.

J. R. Moore—Akron

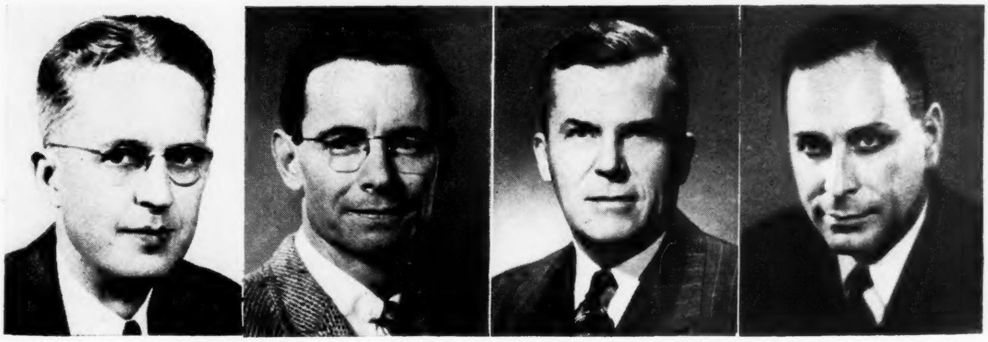
(Left to Right)

C. W. Christensen, Treasurer;

R. R. James, Northern Calif.;

F. W. Stavely, Chairman Elect;

S. L. Brams, Southern Ohio



November 9. In the first paper, F. L. Kilbourne, Jr., of Xylos Rubber Co., stated that the technically difficult task of reclaiming synthetic rubber is now being accomplished smoothly, and the reclaimed synthetic rubber being produced is equal to or better than reclaimed natural rubber in tire treads. The importance of fine grinding of the scrap rubber and the use of commercial peptizers in reclaiming synthetic rubber were emphasized. The second paper, by J. M. Ball and R. L. Randall, Midwest Rubber Reclaiming Co., presented data to show that the use of reclaimed synthetic and natural rubber, the type available in greatest volume now, as compared with reclaimed natural rubber for 20 to 50% of the rubber compound content, resulted in improved aging in many industrial rubber products. The third paper, by E. F. Sverdrup, J. S. Plumb, and J. C. Elgin, U. S. Rubber Reclaiming Co., Inc., reported on a study of the rate of replasticization of natural and synthetic rubber scrap. A new process with low devulcanization times in minutes and new reclaimed rubbers have resulted from this study, it was stated.

Much interest was evidenced in the paper by J. T. Blake and D. W. Kitchen, of Simplex Wire & Cable Co., in which the effect of soil microorganisms on the rubber insulation of underground wire and cables was discussed. Although actual failure under such conditions of service is rare, the current lead shortage has resulted in less lead sheathing of underground cables, and the problem has assumed greater importance than heretofore. The results of a laboratory accelerated bacterial aging test were presented and natural and GR-S rubber insulation was shown to be somewhat more susceptible than neoprene, polyethylene or polyvinyl chloride insulation to soil microorganisms.

Structural analysis of butadiene-styrene copolymers, with special reference to the new low-temperature GR-S, by means of infrared studies, was reported by E. I. Hart and A. W. Meyer, of U. S. Rubber. Indications of greater regularity of structure for low temperature GR-S could be noted from the data for amount of 1,2 and trans-1,4 addition *versus* temperature of polymerization. Trans-1,4 addition increases and 1,2 addition decreases with decreasing temperature of polymerization.

Similarly, an investigation of the structure of neoprene by the use of radioactive sulfur was reported by W. E. Mochel and J. H. Peterson, of E. I. du Pont de Nemours & Co., Inc.

The molecular regularity of various synthetic rubbers including polybutadiene and polychloroprene was also investigated by measuring the crystallizability of the polymers dilatometrically. This work was described by V. E. Lucas, P. H. Johnson, L. B. Wakefield, and B. L. Johnson, of Firestone Tire & Rubber Co.

A new non-discoloring antioxidant for natural rubber was discussed by D. E. Winkler and F. M. McMillan, of Shell Development Co., and dispersed colors for natural and synthetic rubbers and many plastics were explained by T. G. Sullivan, of Sinclair & Valentine Co.

Three papers on latices were presented by workers of the Firestone company. The first, on emulsifier-free latex by J. M. Willis, showed how the particle size increased as the polymerization reaction rate of various synthetic latices decreased. Factors affecting emulsion stability in blends of GR-S and natural rubber latices were detailed by K. W. Gardiner, and the mechanical stability test for natural rubber latex was analyzed by H. G. Dawson.

Chemical plasticization of natural rubber by the introduction of Pepton 22 into the latex on the plantation and the use of this catalytic plasticizer with low-temperature GR-S were discussed in a paper by A. R. Davis, A. C. Lindaw, and Ralph A. Naylor, of American Cyanamid. Evidence of improved cut growth resistance after aging for the GR-S was found.

The Business Meeting

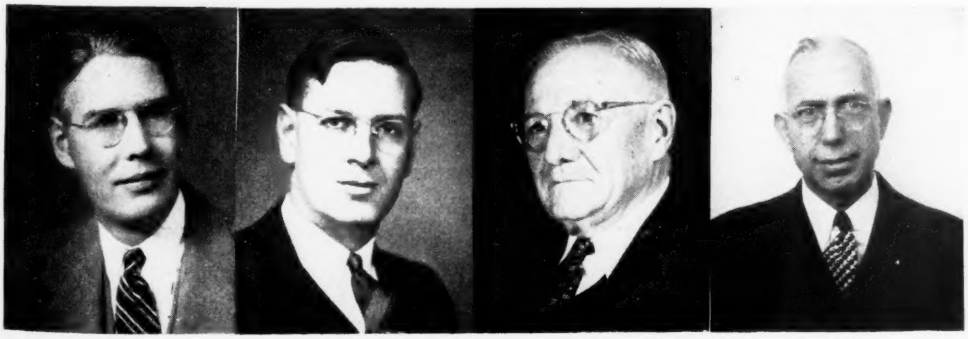
The business meeting of the Division on the morning of November 9 heard first the report of the tellers committee composed of R. G. Seaman, India RUBBER WORLD; I. Lightbown, Enjay Co.; and E. S. Kern, R. T. Vanderbilt; on the results of the letter balloting for officers and directors for 1949.

The new chairman of the Rubber Division, who took office at the conclusion of the Detroit meeting, is H. I. Cramer, Sharples Chemicals, Inc. Secretary is C. R. Haynes, and treasurer is C. W. Christensen, Monsanto Chemical Co. Chairman-elect is F. W. Stavely, Firestone.

Directors from the areas of the sponsored local rubber groups are: Akron, J. R. Moore, Harwick Standard Chemical Co.; Boston, J. T. Blake; Buffalo, J. Augenstein, U. S. Rubber Reclaiming; Chicago, C. E. Frick, Van Cleef Bros.; Connecticut, F. L. Holbrook, U. S. Rubber; Detroit, J. W. Temple, U. S. Rubber; New York, J. E. Waters, General Cable Corp.; Northern California, R. R. James, Mare Island Naval Shipyard; Philadelphia, W. B. Dunlap, Jr.; Rhode Island, D. C. Scott, Sr., Scott Testers, Inc.; Southern Ohio, S. L. Brams, Dayton Chemical Products Laboratories; and Los Angeles, D. C. Maddy, Harwick Standard.

In accordance with the by-laws of the Division, the unsuccessful candidate for chairman-elect, G. H. Swart, General Tire & Rubber Co., and the retiring chairman, Mr. Outcault, also serve as directors for one year. With C. C. Davis, Boston Woven Hose, and E. H. Krismann, du Pont, editor and advertising manager, respectively, of *Rubber Chemistry and Technology*, the executive committee of the Division is complete.

Photographs of the new chairman, chairman-elect, secretary, treasurer, and the un-



(Left to Right)

W. B. Dunlap, Jr., Philadelphia;

J. T. Blake, Boston;

D. C. Scott, Sr., Rhode Island;

C. E. Frick, Chicago

J. Augenstein, Buffalo

G. H. Swart, Director

C. R. Haynes, Secretary

J. W. Temple, Detroit

successful candidate for chairman-elect, together with the new directors from the areas of the sponsored local rubber groups will be found on this and accompanying pages.

S. G. Byam, du Pont, and R. A. Schatzel, Rome Cable Corp., were appointed to represent the Division on the Council of the Society in accordance with a recent provision to provide for more active participation of the various Divisions in th affairs of the Society. A. M. Neal, also of du Pont, was appointed as alternate for either Messrs. Byam or Schatzel.

The next report submitted was that of the chairman of the membership committee, J. C. Richards, Jr., B. F. Goodrich Chemical Co. A total of 290 new members (225 regular, 65 associate) has been obtained for the Division as a result of the work of this committee. In addition, 39 new members for the A. C. S. were also secured.

A report on the library project of the Division by B. S. Garvey, Jr., Sharples Chemicals, was next presented. A tabulation of all literature on rubber chemistry and technology is being made at the University of Akron, and more and more libraries are being added to the source of available literature. The procedure for using the library service of the Division was reviewed, and it was added that the previously unavailable literature, such as papers presented before Division meetings, but never published, was being collected as rapidly as possible.

Another volume of the "Bibliography of Rubber Literature," this time for the years 1942 and 1943, should be ready for distribution to members in January, 1949.

Work on the book, "Synthetic Elastomers", a 1,000-page volume being prepared by a board of editors headed by G. S. Whitby, University of Akron, and including R. F. Dunbrook, Firestone, and C. C. Davis, is continuing, and distribution is expected during the middle of 1950. The cost of this volume is to be $10.

The Rubber Division has decided to withdraw its participation in the high polymer forum programs of the Society beginning in 1950. Authors having papers of direct interest to members of the Rubber Division will be encouraged to present them before that Division rather than as a part of the high polymer forum program.

It was announced that the method of selecting and electing directors of the Division is being reviewed in an attempt to provide a more representative method. Election of directors from the areas of the sponsored local rubber groups does not provide proper representation of the number of members in certain areas, and a procedure whereby areas with a smaller number of members will be combined so that the total membership will equal areas with a larger number of members is under consideration. Then a procedure whereby the combination and the area with the larger membership will each elect one director is also being considered.

The next meeting of the Rubber Division is scheduled for Boston, Mass., May 23-25, 1949, with headquarters at the Hotel Statler. This meeting will be separate from that of the parent Society, which will be held in San Francisco, Calif. J. C. Walton, Boston Woven Hose, is chairman of the local committee for the Boston meeting. The fall meeting of the Division will be held as a part of the A.C.S. meeting in Atlantic City, N. J., in September, with headquarters at the Chalfonte-Haddon Hall Hotels.

It was mentioned that as a result of a discussion during the year between the editor of *Industrial and Engineering Chemistry* and the officers of the Rubber Division, publication of papers presented before the Division either in journals of the Society or the rubber trade journals may now be accomplished somewhat more rapidly than previously. It is expected that by suggesting a period of not more than four weeks per paper per A. C. S. review board member, decisions on publication of papers in Society journals or release to other publications will be reached more promptly, with ultimate benefit to all concerned.

At the close of the business meeting, a rising vote of appreciation was given Chairman Outcault for his work during the current year.

The Division Banquet

The regular banquet of the Division was held on the evening of November 9 in the ballroom of the Hotel Book-Cadillac. About 750 members and guests enjoyed the dinner and program of entertainment arranged by a committee headed by G. M. Wolf, Sharples Chemicals. A special feature was the presence of J. P. Keller, president of Chrysler Corp., as a guest of the Division. Mr. Keller spoke briefly on the work of the automotive industry and its close relation with the rubber industry in the production of passenger automobiles, trucks, and buses. He paid tribute to the contributions of the chemists and engineers of both industries in furthering progress in the field of automotive transportation.

Local Group Luncheon

At the luncheon held on November 10 for representatives of the sponsored local rubber groups, the new Division chairman, H. I. Cramer, presided.

The major part of the discussion at this luncheon was concerned with the report read by J. H. Ingmanson, Whitney Blake Co., for S. Collier, chairman of a committee charged with providing a definition of the extent and limitations of Division "sponsorship" of local rubber groups. Reference was made to the original Division policy in connection with the formation of local rubber groups that encouraged membership in these local groups for anyone having an interest in the rubber industry. It was again emphasized that such local group membership did not include any of the rights and privileges of membership in the Division of Rubber Chemistry, A.C.S., unless the local group member also joined the Rubber Division as an associate or regular member.

The complete report will be made available to officers of the local groups within a few weeks and will be summarized in the next issue of India RUBBER WORLD.

High Polymer Lectures

THE 1948-1949 lectures on the chemical and physical properties of high polymers, given by leading scientists in the field, continue the series of seminars presented for the past three years by the National Bureau of Standards, Washington, D. C. The program, arranged under the chairmanship of Robert Simha, of the Bureau's division of organic and fibrous materials, consists of seven lectures open to the public without charge. The lectures this year, listed below, are of particular interest to research workers in rubber, leather, plastics, and high polymer theory.

October 7: "Dielectric and Mechanical Properties at High Frequencies," Goeffrey Gee, British Rubber Producers Research Association.

November 4: "Some Structural and Chemical Properties of Collagen Fibers," F. O. Schmitt, Massachusetts Institute of Technology.

January 6: "Rheological Properties of Polystyrene," R. S. Spencer, Dow Chemical Co.

February 24: "Some Aspects of Dynamic Rubber-Like Elasticity," A. W. Nolle, University of Texas.

March 3: "Reactions of Free Radicals with Hydrocarbons," E. W. R. Steacie, National Research Council.

April 7: "Variables Which Influence the Properties of Chemical Rubbers Prepared by Emulsion Polymerization," C. F. Fryling, Phillips Petroleum Co.

May 5: "The Chemistry of Some Derived Polymers of the Vinyl Series," W. O. Kenyon, Eastman Kodak Co.

Chicago Panel on Compounding Mechanical Goods

A PANEL discussion on "Compounding Mechanical Rubber Goods" featured the October 29 dinner-meeting of the Chicago Rubber Group at the Morrison Hotel, Chicago, Ill. Approximately 155 members and guests heard the discussion by the panel composed of William M. Hanley, Vail Rubber Works; Leon J. D. Healy, consultant; W. H. Lussie, R. T. Vanderbilt Co.; Paul F. Niessen, Victor Mfg. & Gasket Co.; H. W. Rehfeld, Inland Rubber Co.; and Calvin S. Yoran, Brown Rubber Co.

The questions submitted to the panel, and the answers given follow:

Q. 1. What are the lightest practical densities of chemical sponge that can be made with natural, nitrile-type, or reclaimed rubber?

A. (*Dr. Yoran.*) The question of sponge rubber density is rather complex inasmuch as it varies with thickness. For example, a compound which may be blown to a density of 0.20 oz./cu. in. in a ½-inch thick sheet may give a density of 0.40 in a 1/16-inch thick sheet. A standard test slab thickness of ½-inch has been established by ASTM, and on this basis a density of 0.20 oz./cu. in. would be a practical minimum for nitrile or reclaim-type sponge; while natural rubber sponge will probably go down to a 0.16 density. These minimum densities are being obtained in the industry in production compounds using sodium bicarbonate as the principal blowing agent.

Q. 2. Do you recommend application by the consumer of any kind of paint, wax, or dressing to minimize sidewall cracking or checking of tires in service?

A. (*Mr. Rehfeld.*) Tire paint or wax is usually sold as an appearance dressing only and have little or no value to prevent cracking or checking. It is useful, however, for protecting tires on vehicles in storage.

Q. 3. What is the most effective method to reduce backrinding of molded goods?

A. (*Mr. Niessen.*) Backrinding or flashback is caused by the sudden release of internal pressure arising from thermal expansion in the compounding during the rise to curing temperatures. In general, backrinding is affected by the following factors: (1) volume and shape of the uncured blank in the mold cavity; (2) type of filler in compound; (3) ratio of filler to elastomer; (4) curing temperature and pressure; and (5) mold design. To prevent or minimize backrinding one or more of the following may be useful: (1) ring- or plunger-type molds are preferable; (2) control volume of compound used in mold cavity; (3) use fillers with low coefficients of thermal expansion; (4) increase ratio of filler to elastomer if possible; (5) avoid curing at high temperatures; and (6) cool molded parts under pressure.

Q. 4. How do channel and furnace blacks, including the smooth-out and high abrasion as well as SRF types, compare in their effect on the bonding strength of rubber and metal parts?

A. (*Mr. Lussie.*) All channel and furnace blacks, including the thermal types, give satisfactory performance to rubber-to-metal adhesions. In fact, all types of blacks are being used in the industry with good results.

Q. 5. To your knowledge, has a satisfactory hydraulic packing compound been developed for operation in Lindol (tricresyl phosphate) at temperatures up to 150° F?

A. (*Dr. Healy.*) Lindol has a powerful softening and swelling effect on most elastomeric hydraulic packing materials. Probably a combination of 80 parts "Thiokol" FA and 20 parts nitrile-type rubbers would be about as satisfactory as anything used. It would be necessary to compound the stocks separately and then blend them so as to incorporate the requisite curing agents for optimum properties. For minimum compression set, SRF or Philblack A would be preferable in the nitrile rubber component, and P-33 or Thermax in the "Thiokol" component of the blend.

Q. 6. How are industrial rolls cured?

A. (*Mr. Hanley.*) All industrial rolls are cured in open steam after having been jacketed and cross-wrapped; the cross-wrapping starts from the center of the roll and works out to the ends. Cures depend on the type of stock used, stock thickness, and roll size. Step-up cures with temperature and time accurately controlled are generally used. After curing, large rolls are allowed to cool down slowly for periods up to two days before grinding.

Q. 7. Can you give some idea of the sizes of industrial rolls?

A. (*Mr. Hanley.*) Industrial rolls are of all types, sizes, and hardnesses. The longest roll we have covered was 20 feet long, including journals, and the largest diameter was 30 inches. The heaviest rolls we have handled weigh about 10 tons, most being paper mill press rolls, although weight may range down to only a few pounds.

Q. 8. What determines whether natural rubber or GR-S shall be used in any given product?

A. (*Mr. Rehfeld.*) Use of rubber in tires is controlled by Rubber Order R-1, but in products other than tire the factors of end-use and cost are the determinants.

Q. 9. How fresh must Ty-Ply be for best adhesion?

A. (*Mr. Lussie.*) The Ty-Ply rubber-to-metal adhesives should not in general be stored for more than six months.

Q. 10. In what ways does hard rubber sponge differ from soft sponge in compounding and molding techniques?

A. (*Dr. Yoran.*) In the laboratory we have made a hard rubber or ebonite-type sponge using 30% sulfur with the customary sponge procedures. The compounding of the firmer or harder grades of sponge resembles that of higher durometer mechanical rubber compounds. Higher loadings of reinforcing pigments are used, with a reduction in plasticizer content, and prepared blanks must be closer to final shapes than with soft sponges which blow further.

Q. 11. What is the best acceleration and vulcanizing agent for a Vistanex-rubber-Durez #12687 Resin compound?

A. (*Mr. Niessen.*) According to the literature, thiazole-type accelerators are recommended for phenolic resin-rubber blends and Vistanex-rubber blends and should be satisfactory for use with the three-component compound.

Q. 12. What methods are best suited for avoiding blistering and calender cold checks in high cavity slab soling stocks having Shore "A" hardness values of 90?

A. (*Dr. Healy.*) Blistering and calender cold checks in high hardness slab soling are generally caused by the same conditions. Overloading and improper balance of rubber, fillers, and plasticizers usually contribute to these faults. In general, stocks possessing good calendering characteristics also have good molding properties. Excessively sticky stocks are prone to trap air, as do also mushy stocks obtained by overloading with fillers and improper plasticizer balance. Stocks having too critical a calendering range should be avoided. Resinous extenders having low, sharp melting ranges are conducive to weak, mushy, and sticky stocks at processing temperatures. Resin extenders having a long softening range, notably the modified styrene resins, are usually better for heavily loaded stocks. The following may help minimize cold check and blistering: (1) use resins of the modified styrene-type as extenders; (2) maintain uniform warming and calender temperatures; (3) guard against scorching in processing prior to curing, using retarders if necessary; (4) calender stock as thin as possible to reduce chances for trapped air; (5) age stocks before curing; (6) avoid excessive overflow; (7) maintain proper pressure on stock during cure; and (8) keep molds thoroughly clean.

Q. 13. What procedure is used in figuring the shrinkage of production molds?

A. The consensus of opinion of the panel was to use the so-called "slab test" in determining shrinkage. The percentage of shrinkage may be calculated from the difference in dimensions between the mold cavity and the resulting vulcanized pieces. The size of the slab or its thickness is not standard and may range from a four- by four-inch square to a six- by four-inch rectangular shape, or even to a circular disk.

Q. 14. Is it possible to control the conductivity of an electrically conductive stock?

A. (*Dr. Healy.*) Conductivity of such a stock is rather difficult to control unless exacting controls of the compounding ingredients and processing are maintained. A good grade of uniform conductive black is necessary, and the moisture content of the fillers must be controlled. Mixing and milling operations must be kept constant, and the black must be dispersed as quickly and uniformly as possible. Excessive milling will tend to destroy the chain structure of the black and hence reduce the conductivity of the rubber. For the same reason, scrap stock should not be rerun. The state of cure must also be fairly uniform, and electrical testing of the stock performed carefully.

Washington Group Hears Wood

APPROXIMATELY 65 members and guests of the Washington Rubber Group attended a meeting on October 26 at the Cosmos Club. Guest speaker was Lawrence A. Wood, chief of the rubber section, National Bureau of Standards, who discused "Rubber Technology and Research in Western Europe," based on his recent trip to England, Holland, France, and Switzerland. Using slides of photographs taken during the trip, Dr. Wood described his visits to some 20 rubber research and testing laboratories in these countries and the impressions gained.

France is now consuming about 90,000 long tons of rubber a year, Dr. Wood said, but no appreciable quantity of synthetic rubber is being produced there or imported at present. The French tire industry is dominated by the Michelin, Hutchisson, and Goodrich-Colombes companies, but a

tire shortage exists since 40% of production is exported to obtain foreign exchange. Development work on metal cords for tires is being done by Michelin, and varied rubber research work, of both fundamental and practical natures, is being carried on at the French National Center of Scientific Research and the French Rubber Institute.

The Swiss government maintains a rubber and plastics testing program at the materials testing laboratory affiliated with the Federal Technical University in Zurich, Dr. Wood stated. Fundamental work on rubber elasticity and thermodynamics is also being conducted at the University of Geneva and the University of Basle.

Speaking of the Netherlands, Dr. Wood described his visits to the Rubber Foundation at Delft and the Rubber Research Institute and the work being done there on testing methods, stress-strain relations, rubber permeability, rubber crystallization, and dynamic stresses. The laboratories of the Royal Dutch-Shell petroleum company in Amsterdam are working on a new fiber derived from natural rubber.

Dr. Wood concluded with a description of his extensive visit in England where he viewed the work being done by the British Rubber Producers' Research Association, the Research Association of British Rubber Manufacturers, Dunlop Rubber Co., Ltd., and the Imperial Chemical Industries. The speaker also discussed the course in rubber technology offered by Northern Polytechnic in London and plans to expand this course into a National College of Rubber Technology. Dr. Wood, moreover, spoke briefly of the June 28-29 meeting in London of Technical Committee 45 (Rubber) of the International Organization for Standardization, and the Second International Rubber Technology Conference in London on June 23 to 25.

The meeting was presided over by Chairman T. A. Werkenthin, Bureau of Ships, who in the brief business session preceding the talk announced the following new committee chairman: publicity, R. W. Hackett, Office of Rubber Reserve; program, T. R. Scanlan, Gates Rubber Co.; and membership, Richard Harmon, Bureau of Ships.

Holbrook Addresses Group

A TALK on "Accelerators and Antioxidants and Their Application in the Rubber Industry," by Frederick L. Holbrook, Naugatuck Chemical Division of United States Rubber Co., was the feature of the November 5 meeting of the Connecticut Rubber Group, at the Tuttle Music Shed, Naugatuck, Conn.

After a brief introduction, including definitions of terms, Mr. Holbrook said that the first accelerators known were inorganic basic materials such as basic lead carbonate, lime, magnesia, and litharge. These materials have been superseded by organic accelerators which are more powerful and give vulcanizates of improved quality and durability. The commercially important organic accelerators may be classified into two main groups: (1) organic bases, including aromatic and aliphatic amines, guanidines, and aldehyde amines; and (2) sulfur and carbon disulfide reaction products of organic bases, including dithiocarbamates, thiuram sulfides, thiazoles and their derivatives, and xanthates.

The thiazoles rank first in industrial importance, the speaker stated, and supply the bulk of the primary acceleration used today. Next in line come the guanidines, thiurams, and dithiocarbamates, all of which are used chiefly as secondaries with thiazoles.

Turning to antioxidants, Mr. Holbrook gave a brief review of their development and importance and stated that these materials are also of two main categories: (1) secondary aromatic amines; and (2) phenolic bodies. The amine antioxidants are the larger group and more important commercially than the phenolic materials, but the latter are comparatively non-staining. After a discussion of the mechanism of discoloration and staining of antioxidants in rubber, the speaker concluded with a review of the structural formulae of the most common accelerators and antioxidants.

New officers of the Group were installed at a brief business session preceding the talk. These new 1948-49 officers are: chairman, Stuart M. Boyd, Naugatuck footwear division, U. S. Rubber; vice chairman, Donald F. Spengler, Sponge Rubber Products Co.; treasurer, Carl Larson, Whitney Blake Co.; secretary, George Sprague, Sponge Rubber Products; and directors, Hugh V. Allison, Allison Co., Gordon T. Vaala, E. I. du Pont de Nemours & Co., Inc., Edmund J. Butler, General Electric Co., and Alfred J. Jennings, also of du Pont. The meeting concluded with a tour through the new chemistry laboratory of Naugatuck Chemical.

Jet Propulsion Discussed

THE Northern California Rubber Group held its first meeting of the current season on October 28 at the Claremont Hotel, Berkeley. Approximately 56 members and guests heard Col. B. S. Mesick, Ordnance Research and Development (Rockets) at California Institute of Technology, speak on "Military Application of Jet Propulsion." Colonel Mesick's talk was identical with that which he gave at the October 5 meeting of The Los Angeles Rubber Group, Inc., which was reported in our November issue.

In addition to the speaker there was also a showing of the sound motion picture "Rubber," released by the Rubber Development Bureau. In the business session Don Good, American Rubber Mfg. Co., reported on plans for the Group's Christmas Party, scheduled for December 13 at the Club Alsam, Lafayette. Entertainment during the dinner was provided by the harmonies of the "Four Peptizers."

Rubber in Naval Aircraft

Approximately 37 members and guests of the Northern California group attended a dinner-meeting November 18 at Angelo's Restaurant, Oakland. President Ross E. Morris, Mare Island Naval Shipyard, presided over the meeting, which featured talks by Willa T. Wadleigh, Naval Air Station, Alameda, on "Application of Rubber in Naval Aircraft," and Rolla H. Taylor, Natural Rubber Research Station, Salinas, on "Microscopical Method for Determining the Profile of the Cut Edge of Died-Out Rubber Test Specimens."

Mrs. Wadleigh's talk dealt mainly with the failures in service of various rubber items used in aircraft. Ozone cracking of airplane tires and protective coatings for tires were discussed. The failure of self-sealing gasoline tanks was described, and the cause traced to changing from aromatic to alkylated gasoline. The speaker concluded with a plea that cement manufacturers identify their products as to source and date of manufacture and to include directions for application. Mr. Taylor's paper appears on page 345.

In the business session preceding the talks, Mr. Good again reported on plans for the Group's annual Christmas Party. A report on funds available for the party was made by Treasurer Neil McIntyre, Oliver Tire & Rubber Co., and Publicity Chairman G. B. Farwell, Goodyear Tire & Rubber Co.

Nominations for officers of the Group for 1949 took place, with the following candidates selected: president, Mr. Good, and F. W. Swain, Pioneer Rubber Mills; vice president, R. J. Henderson, American Rubber, and J. W. Hollister, Mare Island Naval Shipyard; secretary, R. R. James, also of Mare Island, and J. A. Sanford, also of American Rubber; treasurer, Mr. McIntyre, and G. S. Ramsey, Goodyear Rubber Co.; and directors, A. E. Barrett, Mare Island, Mr. Farwell, J. A. Liljegren and S. Mason, both of Pioneer, G. I. Petelin, Goodyear Rubber, J. Pugh, Shell Chemical Co., T. W. Snedden, Pacific Rubber & Tire Mfg. Co., and Mrs. Wadleigh.

Wood Addresses Polymer Group

"CRYSTALLIZATION of Rubber and Related Compounds" was discussed by Lawrence A. Wood, National Bureau of Standards, at the November 5 meeting of the Akron Polymer Lecture Group, at Simmons Hall, University of Akron, Akron, O.

Natural rubber and related synthetic polymers are ordinarily classed as amorphous substances and regarded as being distinctly different from crystalline materials. In recent years, according to Dr. Wood, it has become apparent that under proper conditions various types of rubber will show all the phenomena associated with crystallization and the melting of crystals. Crystallization occurs during stretching of rubber at normal temperatures, and in some rubbers will occur without stretching if the temperature is sufficiently low. This latter fact results in severely limiting the use of some polymers at low temperatures.

Dr. Wood pointed out that the temperature at which neoprene crystallizes depends on the temperature at which it was originally polymerized; the lower the polymerization temperature the lower the crystallization temperature. GR-S does not crystallize, although butadiene-styrene copolymers containing 15% or less of styrene do crystallize. The speaker concluded with a description of the methods used in the study of crystallization and discussed the general characteristics of crystallization in a number of high polymers.

The next lecture in the series, scheduled for December 3, will be on "Monomer Reactivity Factors" and will be presented by C. C. Price, University of Notre Dame. Other lectures in the series follow: January 21—"High Polymer Chemistry of Textile Fibers," Milton Harris, Harris Research Laboratories; February 4—"Statistical Mechanics of Rubber-Like Materials," H. M. James, Purdue University; March 4—"Reactions of Simple Alkyl Radicals," E. W. B. Steacie, National Research Council; and April 1—"The Preparation of Linear Polyalkylene Sulfides," C. S. Marvel, University of Illinois.

Rubber in Airplanes

THE Los Angeles Rubber Group, Inc., held its regular monthly meeting on November 9 at the Hotel Mayfair, Los Angeles, Calif. Approximately 65 members and guests attended the afternoon technical session, presided over by George Miller, W. J. Voit Rubber Corp., which featured a paper on "Rubber Applications in the Aircraft Industry" by T. E. Piper, chief materials and process engineer, Northrop Aircraft, Inc.

Although the weight of rubber parts used in the construction of airplanes is very low percentage-wise, upon their proper functioning depends the successful operation of the plane. The sudden variations in temperature encountered by a plane present a serious problem for rubber parts. A plane standing on the Mojave Desert at a structural temperature of 180° F. may a few minutes later be flying at an altitude of 50,000 feet where the temperature is below —70° F.

Rubber is used for pressure sealing of all airplane personnel compartments where at 50,000-feet altitude the atmospheric pressure is 1.68 p.s.i. as compared with 15 p.s.i. at sea level. The application of rubber in airplanes extends to other important functions, such as fuel lines, pressure lines, shock mounts, fuel tanks, bearing boots, tires, and many others. As illustrations, the speaker mentioned the Northrop Flying Wing bomber which has approximately 5,671 pounds of rubber parts, representing 9.14% of the total plane weight, and the Northrop P-89 all-weather jet fighter which includes 1,323 pounds of rubber parts, representing 7% of the total weight.

The evening dinner-meeting was "Ohio Rubber Night," with the program, door prizes, and table favors presented by Ohio Rubber Co. Chairman Phil Drew, Goodyear Tire & Rubber Co., reviewed the Group's activities during 1948. Elliot McLaughlin, H. M. Royal, Inc., reported on plans for the Group's Christmas Party, which was scheduled for the night of December 3.

Speaker of the evening was Charles Brandon Rimmer, who gave a very interesting and humorous account of his efforts to fight a traffic ticket and the results thereof. Winners in the drawing for door prizes were Tway Andrews, H. M. Royal, Inc.; R. R. Reese, American Anode, Inc.; N. G. Hovlid, Ohio Rubber; B. E. Biheller, H. Muehlstein & Co.; F. H. Kienzle, Braun Corp.; and W. T. Rinehart, C. K. Williams & Co.

Nichols Medal to Kolthoff

FOR his world leadership in the development of modern analytical chemistry, I. M. Kolthoff, University of Minnesota, has been awarded the William H. Nichols Medal of the New York Section, American Chemical Society, for 1949, it was announced by B. L. Clarke, Merck & Co., chairman of the award committee. Professor Kolthoff is also noted for his extensive fundamental research in recent years on the emulsion polymerization process used in the manufacture of synthetic rubber. Presentation of the medal will be made at a joint meeting of the New York Section, A. C. S., and the American Section, Society of Chemical Industry, on March 11, 1949, at the Hotel Pennsylvania, New York, N. Y.

Synthetic Rubber Developments

RECENT developments in synthetic rubber manufacturing were reviewed by E. R. Gilliland, professor of chemical engineering at Massachusetts Institute of Technology, at the first meeting of the newly established division of the chemistry of rubber and allied substances of the Northeastern Section, American Chemical Society, on October 21 at M.I.T. Major improvements in synthetic rubber are awaiting the development of polymerization techniques more closely resembling the natural processes which take place in the rubber tree, Dr. Gilliland said. He also described the wartime developed process for manufacturing GR-S and reviewed the attempts made to modify the original process in order to obtain a product more closely resembling natural rubber in properties. The most significant development in this direction has been the synthesis of the low-temperature polymers which are superior to ordinary GR-S in compounded physical properties, but still inferior to natural rubber compounded in the same manner for general use, Dr. Gilliland added.

Radioactive Health Hazards

THE health committee of the Rubber Section, National Safety Council, having been assigned the problem of investigating any possible health hazards to industrial employes in the rubber industry as the result of the use of radioactive bars for static elimination, has reviewed available literature on the physiological effects of exposure to alpha, beta, and gamma radiations. The committee has also contacted the manufacturers of the radium and polonium bars and surveyed some of the larger rubber manufacturers to determine whether any health problems have arisen as a result of the development of radioactive static eliminators.

At the present there is rather general agreement that exposure to gamma radiation be kept below 100 milliroentgens per day. There is insufficient data on beta radiation exposure, but pending further work a standard of 100 Mrep. (milliroentgens equivalent physical) per day is tentatively suggested. Alpha radiation has an extremely short range in air, varying from one inch to three inches, and is stopped by very thin films of material. The committee believes that the radium bar, which emits alpha, beta, and gamma radiations, can be used with safety provided these exposure limits are used and the instructions of the manufacturer in his bulletin, "General Information Regarding Functioning, Installation, and Maintenance of Ionotron Static Eliminators," are very carefully followed.

The committee considers that the polonium bar, which is a pure alpha emitter, can be used with safety provided actual contact with the skin is avoided and rubber gloves are used when the bar is being cleaned or handled. The committee further recommends that manufacturers considering the installation of radioactive bars for static elimination obtain and review the article, "Evaluation of the Beta and Gamma Radiation Due to Extended Linear Sources of Radium" by Robley D. Evans.[1]

[1] *J. Ind. Hyg. Toxicol.* 28, 6, 243 (1946).

New Vinyl Stabilizer

STABILIZER L, a new chemical stabilizer developed especially for vinyl resins where outstanding light resistance is of primary importance, is now available from Advance Solvents & Chemical Corp., 245 Fifth Ave., New York 16, N. Y. The new product also provides some heat stabilization when conditions are not too severe. Stabilizer L is a white powder which can be readily milled into the vinyl resin. It is completely water soluble and therefore does not increase the water sensitivity of vinyl films in which it is used, it is also claimed.

When used in quantities of 2-3%, the new product gives exceptional light resistance and stabilizes vinyl resins to prevent discoloration when exposed to sunlight and artificial light tests, it is further claimed. This stabilizer also has been found effective in all of the commercially available vinyl polymers and is also effective when used with various plasticizers, such as phthalates, sebacates, glycol esters, and modified phosphates. It is particularly effective when used with glycol ester-type plasticizers which ordinarily give poor aging in vinyl stocks. Where severe processing conditions are encountered and use of a heat stabilizer is desirable, 2-3% of Stabilizer L can be used in conjunction with 0.5% of the company's heat stabilizers, such as SN, JCX, or #3. Small amounts of lead or calcium stearate are also useful where high heat stability is necessary.

New Hydrocarbon Samples

SIX new NBS standard hydrocarbon samples have been announced by the National Bureau of Standards, bringing to 150 the number of such compounds now available for calibrating analytical instruments and apparatus in the research, development, and analytical laboratories of the petroleum, rubber, chemical, and allied industries. These samples have been prepared as part of a cooperative program of the Bureau and the American Petroleum Institute, begun in 1943. They follow:

NBS Sample No.*		Amount of Impurity,† Mole %	Volume per Unit,‡ Ml.
535-5S	3-Methyl-trans-2-pentene	0.14 ±0.09	5
536-5S	4-Methyl-cis-2-pentene	0.25 ±0.07	5
558-5S	2, 3-Pentadiene	0.15 ±0.07§	5
559-5S	n-Dodecane	0.031 ±0.025	5
560-5S	1-Methyl-3-isopropylbenzene	0.064 ±0.038	5
561-5S	trans-Decahydronaphthalene (trans-Bicyclo-4, 4, 0-decane)	0.04 ±0.03	5

*The designation "5S" indicates a sample of five ml. sealed "in vacuum" in a special pyrex glass ampoule with internal "break-off" tip.

†Purity evaluated from freezing point measurements, as described in *J. Research NBS*, 35,355 (1945), WP1676.

‡Tolerance approximately ±10%.

§Polymer formed while sealed may be removed as residue by simple vaporization of the sample "in vacuum" at an appropriate temperature.

Instructions for transferring standard samples of hydrocarbons "in vacuum" are available upon request. A complete list of NBS standard samples of hydrocarbons, together with instructions for ordering, may also be obtained from the National Bureau of Standards, Washington 25, D. C.

Thiokol Group Hears Platow

R. C. Platow, Bell Telephone Laboratories, was featured speaker at the November 16 meeting of the Thiokol Technical Club. Approximately 105 members and guests were present at the meeting, held at Thiokol Corp., Thenton, N. J., and heard Mr. Platow discuss "Adhesives —Some Fundamental and Practical Applications."

The first part of Mr. Platow's talk was concerned with a new fundamental concept of adhesion. Experimental work indicates that the material being adhered to has an influence on the adhesion obtained. Diffusion of the adhesive into the surface of the material being bonded, and the effect of dipoles in the adhesive have important bearings on the bond obtained. The second portion of the talk covered engineering aspects of adhesion as applied at Bell Telephone Laboratories. The methods of testing to isolate the effect of a single factor or value in any adhesion are difficult to develop, although some improvements have been made. The trend at present is to determine deterioration of the bond, corrosive effects due to the adhesive, and stability of the adhesive for service over a wide temperature range. Mr. Platow concluded with a display of recent developments at Bell in the use of adhesives, including use in sandwich constructions and in the new telephone design.

New Latex and Plastisols

ANODEX HR LATEX, a new latex compound especially designed for applications requiring high heat resistance, and Ameran resin pastes, a new series of plastisols, have been announced by American Anode, Inc., Akron, O. According to company president R. V. Yohe, Anodex HR is the only known stable latex compound that possesses a combination of high heat resistance, good chemical resistance, high elongation, and high tensile strength. Articles dipped, coated, sprayed, or brushed with Anodex HR can withstand temperatures up to 400° F. and retain tensile strengths up to 2,500 p.s.i. and elongations up to 1,000%, it is further claimed. Potential applications include coatings for textiles and fabrics, such as insulating tapes and papers, heat and oil resistant gaskets, oil seals, and others.

The new series of Ameran resin pastes makes available plastisol compounds that are free from entrapped air, thus eliminating one of the greatest problems facing consumers, Dr. Yohe said. These new resin pastes may be used for coating metal and wire, plating racks, pipe lining, wood, textiles, and paper; for molding toys, industrial boots, and gaskets; and for casting film and sheeting. These pastes will be available in a wide range of colors and will be formulated to customers' specifications.

Rubber Compounds Index

AN INDEXING service of rubber compounds, based on the punch card system, is being offered by the Rubber Formulary, 115 George Hay Bldg., 1612 Nineteenth St., Bakersfield, Calif. The service has designed a card which classifies rubber compounds by tensile strength, elongation, hardness, type of rubber hydrocarbon, and black or non-black filler, and provides space for additional classifications by the subscriber. The service is offered as a yearly subscription and consists of monthly abstracts of rubber compounds published in the leading journals. The rubber compounds are reported individually on the cards, together with their compositions, physical properties, and original literature references.

The service permits quick location of any compound in the files by use of a sorting needle, without the need of cross-referencing or extended literature searching. Abstracts of compounds published in 1948 and subscriptions for 1949 are now being offered, and, if warranted by demand, abstracts of previous years will also be prepared. Blank cards are also being offered to compounders for use in incorporating their own stocks into the index. A booklet describing the service in detail is available upon request to the Rubber Formulary.

Kathleen S. Rostler is editor of the service. Holder of bachelor's and master's degrees in chemistry, Mrs. Rostler has worked in the field of rubber chemistry and published several papers on rubber compounding. She is the wife of Fritz Rostler, director of research and development for Golden Bear Oil Co.

Standard Samples for Rubber Compounding

AS AN outgrowth of the successful use of standard samples of rubber compounding ingredients in the government synthetic rubber program, the National Bureau of Standards has added seven of these materials to the list of standard samples supplied to industrial and scientific laboratories. The specification requirements for government synthetic rubbers are now predicated on the use of these standard samples for stress-strain testing of synthetic rubbers. The samples are also available to manufacturers of rubber products for use in connection with procurement of raw materials, process control, and inspection of product quality.

The use of standard samples of compounding ingredients for the testing of rubber was inaugurated in 1943 by the Committee on Specifications for Synthetic Rubbers, under the sponsorship of the Office of Rubber Director and Rubber Reserve Co., now the ORR, and was a vital part of the government synthetic rubber program.

The following standard samples of rubber compounding ingredients are available. All samples are furnished in airtight metal containers except No. 376, which is packaged in glass.

Standard Sample No.	Name	Wgt. per Pkg., Gms.	Pkgs. per Carton	Price per Package, $
370	Zinc oxide	2,000	8	1.65
371	Sulfur	1,000	20	0.60
372	Stearic acid	600	1	1.20
373	Benzothiazyl disulfide	600	40	1.20
374	Tetramethylthiuram disulfide	600	1	2.25
375	Channel black	8,000	4	3.50
376	Light magnesia	140	1	0.85

Orders for these materials should be sent to the National Bureau of Standards, Washington 25, D. C., accompanied by payment in advance. Remittances should be made payable to the National Bureau of Standards. When ordering, specify both number and name of the sample. Shipments will be made express collect unless otherwise specified.

California Section

(Continued from page 351)

Thompson, plastics consultant, introduced the guests and new members. C. L. Wurdeman, Rezolin, Inc., announced that the group's next golf tournament will be held on December 9. Arrangements Committee Chairman D. C. Severance, Lee-Deane Products, Inc., spoke on plans for the annual Pacific Coast SPI Conference, to be held March 17 to 19, probably in Santa Barbara.

Guest speaker was Robert H. Hadow, British Consul General, who discussed "British Colonial Development." Mr. Hadow reviewed the method employed by Great Britain in the management of her colonies and her attempts to develop self-government. Prizes were awarded in a quiz contest on facts relating to the atomic bomb in actual warfare, as follows: desk lighter, donated by Seaboard Machinery Co., was won by K. R. Mergen, Crest Molded Products Co.; a billfold, donated by Electrical Specialties Co., won by Ed Baldwin, Plastic Process Co.; and a merchandise order, donated by E. I. du Pont de Nemours & Co., Inc., was awarded to G. H. Taylor, Glenn H. Taylor Co. The group's next meeting will take place January 18.

New Dow Plastics

STYRONS 475 and 637, two new basic types of polystyrene which expand the use of this plastic in applications requiring increased toughness and light stability, have been announced by Dow Chemical Co., Midland, Mich. Styron 475 has an elongation at break of approximately 10 times that of regular polystyrene, and its impact strength is three to five times greater. This new material is designed primarily to fill the gap which exists between rigid, dimensionally stable polystyrene and the tough cellulosic plastics.

Styron 637 gives crystal and certain polystyrene colors greatly added light stability. It increases color permanence four to five times with no appreciable difference in other properties or molding characteristics. Both new materials are in limited commercial production with Styron 475 being produced in a range of opaque colors; while Styron 637 is primarily available in crystals and whites.

Lester J. Koch, export manager of Witco Chemical Co., 295 Madison Ave., New York 17, N. Y., is on an extensive business trip in Europe, conferring with officials of companies with whom Witco has transacted business in the British Isles and visiting Ireland, England, Belgium, Holland, France, Spain, Italy, Switzerland, and the British and American Zones of Germany.

OTS Bibliography Reports on Rubber Products—XV

THE reports and abstracts thereof given below are taken from the Department of Commerce's monthly publication, "Bibliography of Scientific and Industrial Reports." Reports available in microfilm, enlargement print, or photostatic form may be obtained from the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, D. C., with accompanying check or money order payable to the Librarian of Congress. Reports available in printed or mimeographed form may be obtained from the Office of Technical Services, United States Department of Commerce, Washington 25, D. C., with accompanying check or money order payable to the Treasurer of the United States.

Studies on Regulation and Stabilization by Means of Oximes. Murke. PB-L-35434. June, 1944. 5 frames. Microfilm $1; enlargement print $1.50. Acetoneoxime, levulinic acid dodecyl ester oxime, fluorenoneoxime, o-chlorobenzaldoxime, and C12-aldoxime were compared with Diproxid as regulators for Buna S-25. The higher oximes plus PBN, phenanthrenequinonemonoxime, and acetophenoneoxime were also tested as stabilizers for the Buna S-25 latex. It was concluded that oximes had no effect as regulators for emulsion polymerization of Buna S-25, and that they were unsuitable as stabilizers for synthetic rubber and monomeric chlorobutadiene. Phenanthrenequinioneoxide, however, was considered useful as a stabilizer. (In German.)

Phenol-Camphene Resins as Stabilizers for Buna S. Murke. PB-L-35510. February, 1944. 5 frames. Microfilm $1; enlargement print $1.50. Hydroxycresyl-camphene, resorcin-camphene, and pyrocatechol-camphene resins were tested. Pyrocatechol-camphene resin proved superior to the hydroxycresyl-camphene resin for drying and degradation content of Buna S. Of practical interest is the fact that increased hydroxycresyl-camphene resin content improved the weldability. (In German.)

Note on Buna SSE. Hellwage. PB-L-35533. June, 1943. 4 frames. Microfilm $1; enlargement print $1.50. The report discusses the properties of Buna SSE. It is recommended for adhesive solutions or coatings for cementing Buna in rubber tires. Several Buna SSE compositions are given. (In German).

Directions for the Processing of Buna 85. PB-L-35331. 3 frames. Microfilm $1; enlargement print $1.50. Several compositions are listed for processing Buna 85 and for blending it with natural rubber. (In German.)

Batch Preparation of Perbunan. PB-L-35641. April, 1945. 4 frames. Microfilm $1; enlargement print $1.50. Conditions for the preparation, coagulation, and washing of Perbunan are given. (In German with English translation.)

The Effect of Sodium Hydroxide and Piperidine on the Stability of Buna Latex Mixtures. Bachle. PB-L-35602. September, 1940. 4 frames. Microfilm $1; enlargement print $1.50. Sodium hydroxide in Perbunan SP-zinc oxide mixtures in higher concentration results in coagulation; in Igetex mixtures in great increase in viscosity; and brings about coagulation in Jatex only in the highest concentration of about 28%. Piperidine does not influence the stability of Perbunan SP and Igetex S-zinc mixtures, but brings about coagulation of Latex in 28% solution. (In German.)

Heat Sensitization with Igevin M-40. Sinn. PB-L-35604. January, 1941. 10 frames. Microfilm $1; enlargement print $1.50. This report on Igevin M-40 (polyvinylmethyl ether with K-value of 40) deals with the following topics: heat sensitization of several latices (Perbunan SP, Igetex S, polystyrene emulsion, Igelit PCU, and Jatex) with 20% aqueous solution Igevin M-40; effect of components of a vulcanizable mixture on heat sensitization with the aid of Igevin M-40; blends of Jatex and Perbunan SP; storing heat-sensitized mixtures; and practical applications. (In German.)

Determination of the Solubility of Buna Materials. Logemann. PB-L-35572. June, 1943. 5 frames. Microfilm $1; enlargement print $1.50. Several tables give the results of attempts to obtain quantitative determinations of the solubilities of small Buna samples in benzene, the effect of rolling of the samples, and the effects of addition of PBN and polyacrylamide. (In German.)

Summary of Test Results with Regard to Buna MAM. Oettner. PB-L-35577. October, 1943. 8 frames. Microfilm $1; enlargement print $1.50. An attempt was made to summarize the properties of butadiene-methylmethacrylate copolymers. Six samples were selected containing not more than 25% of the ester copolymer, all polymerized with Diproxid and using either Nekal or Esteramin. These rubber samples are evaluated for their use in rubber tires. (In German.)

Buna Analysis as a Means of Controlling Polymerization Mixtures in the Laboratory. Dennstedt. May, 1944. 17 frames. Microfilm $1; enlargement print $2. Analyses and analytical procedures are discussed. Tables give the complete analysis of several Buna varieties (B, S, AM, MAM, N, MK, AAc, and others), and include emulsifier content, ash, resin content, Defo values, etc. The effects of Diproxid and phenyl-beta-napthylamine on the analysis are also discussed. (In German.)

Experiments for the Cross-Linking of Buna S Polymers. Muhlhausen. PB-L-35586. August, 1944. 8 frames. Microfilm $1; enlargement print $1.50. Different methods for inducing cross-linkages were tested. The effect of the cross-linkage on the physical properties of the Buna S polymer was investigated. The complete results of the various tests appear in tables. (In German.)

Ultra-Filtration of Buna Latices. Sinn. PB-L-35596. April, 1940. 4 frames. Microfilm $1; enlargement print $1.50. This report describes filtration and concentration of Buna S, Buna SS, Perbunan SP, and Perbunan Extra latices with the use of the ultrafiltration apparatus and filters of the Membranfiltergesellschaft Gottingen. A comparison is made of the properties of 32% Buna S latex and 46.7% latex obtained by concentration. (In German.)

Stability of Buna Latices in the Presence of Zinc Oxide. Sinn. PB-L-35597. May, 1940. 4 frames. Microfilm $1; enlargement print $1.50. The stability of Buna latices in the presence of zinc oxide was determined by Dr. Bachle's method. The low stability of Buna S latices, as compared with Perbunan SP, was due to the linoleic acid contained in the Igetex. Addition of ammonia in an increase in the stability of the Buna latices. (In German.)

Heat Sensitization of Buna Latices. Sinn. PB-L-35598. March, 1940. 22 frames. Microfilm $1; enlargement print $2.50. A study was made of the heat sensitization of latices which coagulate upon heating to some definite temperature. Tables illustrate the effect of ammonium salts, temperature conditions, tests with various stabilizing agents, effects of mono-, di-, and tri-valent electrolytes (chloride salts of sodium, calcium, and aluminum), and coagulation in Igepon T solutions. The practical applications of the heat-sensitization process to produce various rubber articles, such as dipped goods, rubber fibers, foam rubber, etc., are also considered. (In German.)

The Stabilizing Effect of Condensation Production with Ethylene Oxide on Buna Latices. Sinn. PB-L-35600. June, 1940. 16 frames. Microfilm $1; enlargement print $2. Condensation products of ethylene oxide were tested as stabilizing agents for the thermal sensitization process and were dealt with in a previous report, PB-L-35598. The present report describes tests which demonstrate the good results obtained with condensation products of ethylene oxide with the higher alcohols; the better values are obtained with increase in chain length. The condensation product of Leuna alcohol (isooctyl alcohol plus 13.5 moles of ethylene oxide) approached Emulphor O in value as a stabilizing and emulsifying agent. (In German.)

German Chlorinated Rubber. S. A. Brazier and others. PB-L-91681. (BIOS Final Report 1626, Item 22.) April-May, 1947. 52 pages. Microfilm $2.25; photostat $6. It was possible to obtain a fairly reliable assessment of the experience gained in the usage of chlorinated rubber paints in Germany. The principal general outlet for chlorinated rubber, apart from the I. G., had been general protective paints and lacquers. Much of the information obtained was dependent on the memory of the persons interrogated, as many records had been destroyed or lost. In the established usages for chlorinated rubber paints no evidence was obtained that it had given unsatisfactory technical service, and no major problems in its usage had been encountered other than the essential need of preparing the metal surface prior to coating. Notes are included on the use of chlorinated rubber as a molding powder, as an adhesive, and in non-flammable insulating compounds.

Improvement of the Electrical Properties of Buna. Roelig and Ecker. PB-L-35567. December, 1942. 18 frames. Microfilm $1.25; enlargement print $2. The results of tests with several types of Buna S and SS and Buna SK are given. The tests compared effects produced by emulsion and black polymerization, acid and alkaline polymerization, styrene content, stabilizers, and linoleic acid content. (In German.)

Electrolysis of Buna Latices. Sinn. PB-L-35605. February, 1941. 31 frames. Microfilm $1.25; enlargement print $3.50. The report includes some discussion of the following: electrode material and size; strength of current; behavior of accelerators, fillers, and plasticizer emulsion; electrolysis of dialyzed electrolyte-free Perbunan SP and Igetex S; and electrolysis with various concentrations of Perbunan SP. (In German.)

Ultra-Accelerator for Buna Latex. Bachle. PB-L-35611. August, 1943. 13 frames. Microfilm $1; enlargement print $1.50. Tests were conducted to find substitutes for Vulcacit P. The compounds tested included Vulcacit 774, Vulcacit P Extra N, tetramethylene-dithiocarbamic acid pyrrolidine (TP), and several compounds similar to TP. The tests were made with Igetex SS and Igetex NN. TP gave good results. (In German.)

The Use of Igetex in the Preparation of Fiber Leather. Sinn. PB-L-35619. February, 1944. 10 frames. Microfilm $1; enlargement print $1.50. Dispersions of Igetex N, NN, S, and SS were combined with leather scrap and vulcanized to form fiber leather. Physical tests were carried out on these samples to determine strength, flexibility, nailing qualities, abrasion, etc. A blend of Igetex and Acronal was also tested. (In German.)

Breakdown of Perbunan. Schaller. PB-L-35633. November, 1942. 2 frames. Microfilm $1; enlargement print $1.50. The breakdown behavior of Perbunan with various accelerators is reported. The rubber samples were prepared by a continuous process, stabilized with 3% PBN, and made both with and without added linoleic acid. The precipitated rubber was dried at 60° in order to avoid breakdown during the drying process. Breakdown was brought about at 130°. (In German.)

Outline of a Model Development of the Thermokinetic Theory of Rubber Elasticity. Lode. PB-L-35680. September, 1943. 11 frames. Microfilm $1; enlargement print $1.50. By means of a model representation, the most important mechanical properties of rubber may be qualitatively illustrated; namely, the great deformability, the order of magnitude of the stresses and their dependence on the temperature; the damping and rebound properties; plasticity and hysteresis; and relaxation and after-effects. (In German.)

Studies on Adhesive Latices. Wolz. PB-L-35681. November, 1943. 5 frames. Microfilm $1; enlargement print $1.50. Tests were carried out on Perbunan W latices known to have very good adhesive properties. The following problems were investigated: (1) the dependence of the adhesiveness on the "rohfell" Defo of Perbunan W latices; (2) the dependence of the tackiness on the acrylonitrile content of the latices; and (3) the effect of a second vinyl compound (styrene) on the tackiness of the butadiene-acrylonitrile compound. Other research dealt with storage tests and the effect of monomer content and of preserving agents (phenyl-beta-naphthylamine, oxycresylcamphene, and tetrahydro-beta-naphthol) on the tackiness. (In German.)

(To be continued)

RUBBER WORLD

NEWS of the MONTH

Highlights—

As the year 1948 draws to a close, it appears that the rubber goods industry will record another 12 months of high-level production and sales. The outlook for 1949 seems to be for a somewhat lower level in transportation items, but the production rate for other rubber goods may reach a new postwar peak next year. With the possibility that world natural rubber production will be also at a new peak in 1949 and with low-temperature GR-S in volume production, a surplus of new rubber may develop. Somewhat more rather than less government in business may be expected as action on inflation and prices is urged by organized labor.

Industry Production Twice 1935-1939 Average, But Trends Lower; Labor Demands New Legislation

Analysis of business trends by the United States Department of Commerce and also by the Cleveland Trust Co. indicates that the rubber goods industry is currently operating at a level about twice that of its 1935-1939 average and that the overall trend is still downward, although at a slow rate. The peak postwar production rate was reached during the first quarter of 1947. The trend for the year 1948 is mixed, with transportation items being produced at a lower rate than in 1947 while non-transportation items are being manufactured at a higher rate than in 1947 and give evidence of reaching a still higher level.

World natural rubber production of 145,000 long tons in September set an all-time record. Production for the first nine months of 1948 is more than 200,000 tons greater than for the same period in 1947. With somewhat lower consumption in the United States, the price of natural rubber has declined steadily during the last several weeks.

Organized labor, as represented by the Congress of Industrial Organizations and the American Federation of Labor, in national conventions during November has not only repeated its demand for the repeal of the Taft-Hartley Law, but has recommended action by the next Congress on such measures as price control, an excess-profits tax, a $1-an-hour minimum wage, allocation of scarce materials, and monopolistic business practices. It is expected that the URWA union, a CIO affiliate, will follow the line of the parent organization in its statements during the next several months.

Industry Trends Mixed

Outlook and trends in the rubber goods industry continue good although they might be called mixed in composition. According to the Department of Commerce on November 15, during the first nine months of 1948, consumption of rubber in transportation items fell 7.1% below that in the corresponding period of 1947, while consumption for other goods increased 14.4% over the 1947 period.

Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co., in a statement during November at the completion of that company's fiscal year, predicted high level employment in the rubber industry and better tires for car owners in 1949.

"During the past year," Mr. Firestone said, "we continued to produce tires at a capacity rate, and next year we anticipate that the demand for tires will be about the same as in 1948."

The number of replacement tires required for passenger cars is 22.5% higher and for trucks and buses 76% greater, as compared with 1939, it was said.

Safer, longer-wearing tires in 1949 are assured because of the production of low-temperature GR-S, and tires made of this rubber have undergone punishing road tests in Texas by the Firestone test fleet. Their performance indicates that the new cold-process type of rubber gives greatly increased mileage, and it seems evident that the development of this new process can be a major factor in making synthetic rubber fully competitive with natural rubber in the mass production of passenger-car tires, Mr. Firestone declared.

In contrast to the optimistic outlook of Mr. Firesetone, the stockholders of the Pharis Tire & Rubber Co. voted authorization for its board of directors to sell all the assets of its plant at Newark, O., its brake lining division at Ridgeway, Pa., and its subsidiary, Carlisle Tire & Rubber Co., Carlisle, Pa. This action was made necessary because the firm was losing money, and its employes would not agree to a temporary pay cut pending a new study of what management termed "inflated" wage rates.

The Cleveland Trust Co. Business Bulletin for November 15 states that although business activity continues high, there have been more reports lately of an easing in some lines, particularly in consumer goods. This has been reflected in lower production in several industries, including textiles, leather products, and rubber products —each of which operated during the third quarter of 1948 at a level noticeably below its postwar peak.

An analysis of industrial production for 11 industry groups from the first quarter of 1946 through the third quarter of 1948, based on the Federal Reserve Board's group indices of industrial production, seasonally adjusted, shows that the rubber products industry reached its postwar peak in the first quarter of 1947 with a figure only slightly less than 2½ times average 1935-1939 production. Industrial production in the rubber products industry has declined to about 2.1 times the 1935-1939 average in the third quarter of 1948.

Of the 11 industry groups, including chemicals, iron and steel, auto parts, food products, machinery, textiles and products, etc., only chemicals and iron and steel have not as yet reached their postwar peak of industrial production.

The U. S. Department of Commerce bulletin, "Industry Survey," for October, 1948, gives the index for value of rubber goods manufacturers' sales for September, 1948, as 348 and the index for the book value of inventories as 288. Figures for August, 1948, were 354 and 287, respectively.

According to The Rubber Manufacturers Association, Inc., in its regular monthly report on tire and tube production, shipments, and stocks, shipments of passenger-car tires declined seasonally in September to 5,530,848 units from the August total of 6,575,964 casings. Production held steady in September at 5,740,418 units, and inventories therefore rose about 5.2% to 7,848,143 units.

A similar trend was evident in truck and bus tire shipments which declined 7.1% to 1,169,488 units, while production declined only 1.7% to 1,174,108. With production exceeding shipments, inventories increased 3.6% to 1,957,080 units.

Shipments of automotive tubes were down 10.4% in September to 6,200,044 units, and production was also 6.7% lower, at 6,191,462 units.

Lockwood's *Rubber Report* for November 15 makes several predictions of interest to the rubber industry based on the reelection of President Truman. The chance of rubber legislation coming to an end in 1950 is definitely less than it was before, and the sale of GR-S plants to private industry will be more difficult, it was said. Congress may keep the government in the business of producing synthetic rubber for a long time.

The prospect of an ITO-type international rubber agreement during the next Truman term is much stronger, and the ITO agreement will probably be supported by Congress in substantially its present form. The reciprocal trade agreements program will probably be renewed for another three years without the recently adopted limiting amendments.

The Department of Justice can be expected to pursue its anti-trust activities more vigorously, the Lockwood *Report* states.

ECA and defense funds will be continued in huge volume, and in conclusion it is emphasized that there will be more government rather than less government in business during the next four years.

Tire Dealers' Suit

A report from the annual convention of the National Association of Independent Tire Dealers held during the latter part of October stated that the suit brought by the Association against the RMA and several major tire manufacturers was initiated to restore the "economic freedom" of the independent merchant.

W. W. Marsh, of Hamilton, O., vice president of the tire dealers' organization, referred to a 50% decrease in tire replacement sales through independent outlets during the past quarter of a century and a decrease in the number of tire manufacturers in the same period from 317 to 26 as an indication of the trend toward chain operations and manufacturer-operated outlets.

Mr. Marsh may have obtained his data from last year's report of a study of tire sales made public by Warren W. Leigh, of the University of Akron. According to a newspaper account, a new study

by Mr. Leigh shows the trend of sales by oil companies, chain stores, manufacturers' stores, cooperative associations, and tire dealers, broken down by passenger and truck tires covering the period 1926 through 1947. It was said that the survey revealed an increase in oil-company shipments of 2,704,000 units, or 22% in 1947, as compared with 1946; while chain and mail-order tire sales decreased 1,360,000 units, or 12%. Dealer and distributer sales held practically the same position as in 1946, but sales by tire manufacturers' stores decreased by 42%, the newspaper report said.

Rubber Consumption, Production, and Stocks

According to the Rubber Division, U. S. Department of Commerce, new rubber consumption in the United States in September amounted to 91,109 long tons, a slight decline from the 92,705 tons reported in August and the 92,422 tons reported in September, 1947.

During the first nine months of 1948, new rubber consumption totaled 814,767 tons, a decline of only 1.7% from the 828,692 tons consumed in the corresponding period of the record year of 1947.

Natural rubber consumption in September was 51,898 tons, including 2,234 tons of latex; and synthetic rubber consumption totaled 39,211 tons. The synthetic rubber total was made up of 29,970 tons of GR-S, 5,120 tons of Butyl, 3,388 tons of neoprene, and 733 tons of nitrile-type rubbers. The neoprene figure was the highest since April, 1947, and the nitrile-type rubber figure the highest since May, 1945, it was said.

Consumption of GR-S in September was 36.6% of total natural plus GR-S, compared with 36% in August.

September natural rubber imports, marked by unexpectedly low receipts from Malaya, were only 48,745 tons, including 1,438 tons of latex. Imports from Malaya, totaling 22,395 tons, were the smallest since August, 1946.

Production of synthetic rubber in September, still affected by the shutdown following the fire in the Baytown Butyl plant, and further reduced by a decline in GR-S output on the West Coast, was at a low for the year, 37,890 tons. This total included 31,387 tons of GR-S, 2,543 tons of Butyl, 3,047 tons of neoprene, and 913 tons of nitrile-type rubber. Despite low total production, output of neoprene was within 46 tons of the year's peak; while nitrile-type rubber production established a postwar high.

Reported stocks of new rubber available to industry at the end of September were, in long tons: natural, 123,108 (including 10,777 tons of latex); GR-S, 84,338, Butyl, 6,577; neoprene, 5,000; and nitrile-type, 2,397.

A further analysis of rubber consumption figures by the Department of Commerce stated that in the manufacture of transportation goods during September, consumption dropped to 61,812 tons, as compared with 65,176 tons in August. At the same time, consumption of rubber in other products continued to increase, going to 29,534 tons in September from 27,529 tons in August.

During the first nine months of 1948, consumption of rubber in transportation items fell 7.1% below that in the corresponding period of 1947, while consumption for other goods increased 14.4% over the 1947 period. Non-transportation goods thus are shown to be contributing largely to maintenance of new rubber consumption at a high rate during 1948.

Consumption in non-transport items took 21.3% of the natural rubber used in 1947, but currently is accounting for 27.7% of the total. This increase is far greater than for GR-S, where consumption in these items has risen only to 29.7% in nine months of 1948, from 28.7% in 1947. The use of reclaimed rubber in this field dropped from 59.6% of the total reclaimed rubber consumed in 1947 to 57.9% in 1948. Natural rubber thus is gradually gaining at the expense of reclaimed rubber and GR-S in the field of discretionary rubber consumption, Commerce officials concluded.

Another Commerce report stated that world production of 145,000 tons of natural rubber during September set an all-time record. Total world output of natural rubber during the first nine months of 1948, as estimated by the Secretariat of the International Rubber Study Group, now stands at 1,122,500 tons, an increase of 210,000 tons over the comparable period in 1947.

September production was featured by a new postwar record of 51,600 tons exported from Indonesia and a high production of 64,300 tons in Malaya.

World consumption of natural rubber in September, marked by unusually large imports into Russia, is estimated by the Secretariat at 122,500 tons, also a new postwar record. This includes 51,900 tons consumed in the United States and 70,600 tons in all other countries, compared with 53,400 tons and 54,100 tons, respectively, in August. Consumption during nine months of 1948 amounted to 1,015,000 tons, an increase of 235,000 tons over the similar period in 1947.

World production of 40,000 tons of synthetic rubber in September brought the total for nine months to 397,500 tons. Consumption in September was 42,500 tons, and for the year to date, 367,500 tons.

October U. S. Consumption

The RMA, as has been its custom in recent months, released figures late in November on new rubber consumption in the United States for October. New rubber consumed in October was estimated at 88,069 long tons, 3.4% less than in September, when 91,109 tons were consumed.

October consumption of natural rubber amounted to 49,693 long tons, 4.3% lower than in the previous month, when 51,898 tons were used.

All types of synthetic rubber consumed in October totaled 38,376 long tons, a reduction of 2.1% from September, when consumption totaled 39,211 tons. Of the October total, 29,187 tons were GR-S, 3,188 tons were neoprene, 5,125 tons were Butyl, and 876 were all other types.

For the first 10 months of 1948 total new rubber used amounted to 902,836 long tons, as compared with 931,646 tons in the same period in 1947. Natural rubber consumption in 1948 increased to 525,695 long tons from 454,301 tons for the same period in 1947, and total synthetic rubber consumption declined to 377,141 long tons from 477,345 tons for the 1947 period.

Industrial Relations

According to the *Akron Beacon Journal*, top officials of the United Rubber Workers, CIO, are preparing data and giving consideration to wage policy with special reference to a fourth round of wage increases. The executive board of the union has directed its president, L. S. Buckmaster, to call together "on or before March 1, 1949," the international policy committee which has power to draw up a wage program and policy for local unions to follow.

Besides wage increases, the policy committee will include in its program a drive for pension and retirement insurance. A committee is to study this matter separately and later negotiate for these concessions with the management of the rubber companies.

A further indication of union policy might be found in the annual report of CIO President Philip Murray, released on November 21 on the eve of the tenth constitutional convention of the national union. An eight-point national economic program including price controls, an excess-profits tax, and rationing of essential commodities was asked for by Mr. Murray. It is essential that such a program be developed during a period in which government outlays for armaments and defense, plus continued expenditures for the European Recovery Program, are serving as "temporary props that keep our economy operating."

"We must be in a position," he stated, "to maintain a full-employment-and-full production economy when these temporary props no longer exist."

Since the URWA follows the national CIO policy rather closely, it is expected that the economic program in Mr. Murray's annual report will reappear in URWA policy statements during the next few months.

The strike at the Dayton Rubber Co. which began on October 10 was concluded on October 28 when the company and the local URWA union signed an agreement for a 9¢-an-hour across the board wage increase plus an additional 2¢-an-hour increase to correct inequities among certain workers.

An 82-day strike at the Armstrong Tire & Rubber Co., Natchez, Miss., was ended early in November, when the company and the local URWA union agreed on a settlement by which the workers will receive an 11¢-an-hour wage increase and six paid holidays with double time for those who work on any of these holidays. The agreement called for the workers to return to their jobs by November 15. Eight men charged with precipitating the strike by a sitdown were reinstated, but must remain on probation for a year.

On October 31, Armstrong filed a $500,000 suit in United States District Court in Vicksburg, Miss., against the URWA and its local union #303, charging that the strike was a breach of contract. In its bill of complaint, the company quoted an article in the existing contract which stated that "this agreement remains in effect during negotiations."

At the Akron plant of The B. F. Goodrich Co., a walkout of 60 truckers in the tire plant, idled 3,500 workers from November 8 to 10. The company tried to make a change in trucking procedure which would have required the transfer of about 35 of the truckers to other jobs. The workers agreed to work under the new procedure pending a company-union conference on the dispute.

During the latter part of November a work stoppage idled 2,300 employes of the Firestone Tire & Rubber Co. in Akron. New piece-work rates in the stock preparation department which the local union said reduced the workers pay were the cause of the trouble.

General Latex & Chemical Corp., 666 Main St., Cambridge 39, Mass., has moved its Metropolitan New York sales office to 347 Madison Ave., Suite 1803, New York 17, N. Y.

EAST

Carrier Corp., Syracuse, N. Y., is supplying air conditioning equipment for Dunlop House, a new three-story laboratory and office structure being built in Durban, South Africa. The new building will be occupied by Dunlop South Africa, Ltd., an associated company of Dunlop Tire & Rubber Corp., Buffalo, N. Y. The air conditioning installation is being made by Air Conditioning & Engineering Co. (Natal), Ltd., Carrier representative in Natal Province. Dunlop House will be one of the most modern buildings in South Africa, and its main office block will be completely air conditioned.

Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J., completed its fifty-fifth year of service on October 28. In 1893, Frank C. Jones, Col. Arthur F. Townsend, and George Woffenden founded the Manhattan Rubber Mfg. Co. Mr. Jones became first president, but retired in 1903 in favor of Colonel Townsend who served as president until 1929, when the company merged to form Raybestos-Manhattan. Today Manhattan is one of the largest manufacturers of mechanical rubber goods, including belting, hose, molded goods, packing, rolls, brake lining, abrasive wheels, and others, employs approximately 4,000 persons, and occupies more than a million square feet of floor space.

The development of the Manhattan Moldisc, a bonded disk wheel for rotary sanders, has also been announced by the Division. This bonded disk is said to last longer than a coated abrasive sanding disk and to be more easily handled than a flaring cup wheel. It is also claimed that in certain bond modifications the flexibility imparted to the Moldisc makes it possible to produce superior finishes more readily than is done with coated abrasives of a comparable grit size. Other advantages claimed for the bonded disk wheel include uniform cutting action, increased production, reduced grinding costs, and greater operator safety.

Watson-Stillman Co., Roselle, N. J., through A. G. York, vice president in charge of sales, has announced the appointment of J. T. Gillespie, Jr., as sales manager. Mr. Gillespie joined the company in 1944 as director of export sales, in which capacity he remained until his new appointment, and will continue to supervise the company's export sales as part of his new position. The balance of the company's sales staff remains unchanged.

Beaumont Birch Co., 1505 Race St., Philadelphia 2, Pa., has organized a new chemical materials handling division, which will continue to manufacture the complete line of Beaumont materials handling equipment designed for the process industries and, in addition, will engage in further research and development. The recently announced Beaumont "Multi-Vator," a duplex bucket, perfect discharge, bucket elevator for handling a wide variety of chemicals will be followed by other important developments to be announced in the near future. The engineering staff of this new division is available for rendering assistance on any chemical materials handling problem.

New Schenuit Tire for Jet Bombers

Frank G. Schenuit Rubber Co., Baltimore 11, Md., is producing a new airplane tire designed especially for jet bombers and capable of withstanding the very high landing and take-off speeds obtained with jet propulsion. The new tire contains 113 miles of nylon thread, or 213,570 miles of nylon filament, and 1½ miles of bead wire. For inflation, 240 pounds of air pressure are used, and the tire will carry a static load of 60,000 pounds, roughly two-thirds the gross weight of a modern Pullman.

The company was founded in 1912 by the late Frank G. Schenuit, who in 1928 brought his firm into the aircraft tire field. Today the company is one of the major aircraft tire manufacturers, and its tires are used by our Armed Forces all over the world. Schenuit company officers include Royal C. Neely, president and treasurer; Edgar H. Spilman, vice president and production manager; and Miss Eileen Coffay, secretary.

Pennsylvania Rubber Co., Jeannette, Pa., has made Wm. Tabor service manager of the factory zone branch and David L. Rauterkus service manager of the New York branch. Both men are World War II veterans.

Thomas C. Johnson has been named to the factory zone sales division of Pennsylvania Rubber, covering West Virginia and a southern portion of Ohio. The new appointee joined Pennsylvania Rubber in December, 1946, as service manager of the Chicago branch and in 1948 became service manager of the factory zone branch in Jeannette.

Howard L. Mill has been made New York district sales representative. Mr. Mill, who previously had served as New York branch service manager, joined Pennsylvania Rubber in 1941.

Pennsylvania Rubber has increased production of its Vacuum Cup Cleat tires as the result of a high demand for mud and snow tires. R. B. Cave, vice president in charge of sales, attributed the unprecedented demand for all-weather tires to the scarcity of steel for tire chains and to the use of low-pressure tires which have outmoded previously purchased mud and snow tires.

Mr. Cave also predicts that camelback sales in 1948 for Pennsylvania Rubber will show a 50% increase over those for 1947, because of increased consumption and increased volume throughout the industry. Concentrated sales activity, an improved stock situation, and an improved product were also listed as reasons for the greater sale of Pennsylvania camelback.

ASF Elects

Alexander Fraser, president of Shell Union Oil Corp., was reelected chairman of the Automotive Safety Foundation, Washington 6, D. C., at a recent meeting of the trustees. L. R. Jackson, president of Firestone Tire & Rubber Co., and L. S. Wescoat, president of Pure Oil Co., were elected vice chairmen for the tire and the petroleum industries, respectively. Mr. Jackson replaced H. E. Smith, president of United States Rubber Co.; while Mr. Wescoat replaced Robert E. Wilson, board chairman of Standard Oil Co. (Indiana). In one of the changes in the Foundation's 21-man operating committee, William F. O'Neil, president of The General Tire & Rubber Co., took the place vacated by Mr. Smith. Among the new members elected to the board of trustees were J. P. Seiberling, president of Seiberling Rubber Co., and Robert G. Dunlop, president of Sun Oil Co.

B. F. Goodrich Chemical Co., Rose Bldg., Cleveland 15, O., through President W. S. Richardson, has announced that it will manufacture plasticizers for vinyl and other synthetic resins in substantial volume. Production facilities are now under construction as part of the $3,000,000 Avon Lake, O., expansion announced earlier this year. Initial large-scale operations are scheduled for the second quarter of 1949, Mr. Richardson said, but trial quantities of the new high-quality plasticizers will be available shortly from the company's experimental station pilot-plant at Avon Lake.

Diamond Alkali Co., Cleveland, O., has broadened the scope of its customer service activities by the creation of a new technical service division headed by Walter C. Bates, manager, and George F. Rugar, assistant manager. According to C. C. Brumbaugh, general manager of the company's research and development department, the new division has been set up as an integral part of the research-development organization located at the company's Painesville, O., plant, but will function as a separate unit manned by a staff of 21 technical personnel recruited from the company's pure calcium products division, the research product development group, and trained personnel previously associated with the sales department in Cleveland. Mr. Bates was previously manager of the pure calcium products division; while Dr. Rugar was product development manager of the research and development department.

Industrial Adhesives, Inc., Cincinnati, O., is completing a new office and factory building on a three-acre tract at Blue Ash Rd. and Voorhees Lane. The building is 200 feet long and has two wings each 80 feet long. The center section consists of two stories, the first of which will contain the offices; while the second will house the chemical laboratories. The building is constructed with a green glazed tile front and concrete block side and rear walls. After completion of the building, the company will decide whether to occupy the plant immediately or to use it as a stand-by plant pending the development of additional industrial outlets for the adhesives manufactured by the company and its associate, Synthetics Adhesives Corp.

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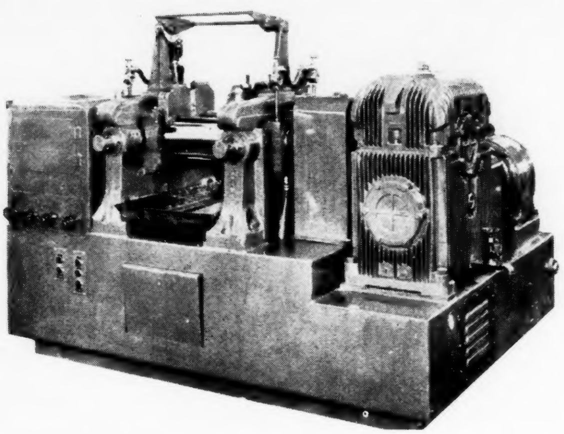


Adamson's Laboratory Mill with Right-Angle Cone-Drive Gearing

Compact Drive on Rubber Mills

Adamson United Co., Akron, O., has announced what is believed to be another first in the rubber industry: the installation of two 60-inch mills set in a compact twin arrangement with both mills driven by a single Cone-Drive geared speed reducer. This installation is now being used to mill rubber floor tile at the Wright Rubber Co., Racine, Wis. As shown in the accompanying illustration, the compactness of the design is largely due to the extremely high load carrying capacity of Cone-Drive gearing. As a result, a speed reducer of only 18-inch center diameter provides a horsepower rating of 400 at the mill speed under 24-hour shock service. The small center distance required with the gearing made it possible to use a reducer with vertical centers. Since the Cone-Drive reducer used is actually narrower than the motor housing, the only limitation in spacing of the two mills is the diameter of the motor housing, and the need of extra floor space for the reducer itself is therefore eliminated. The compactness of the design also permits a reduction in height of the bed plate under the electric motor which can then be placed between the two mills.

Adamson also used a Cone-Drive speed reducer connected directly to the roll by a universal-type coupling in the set-up of a smaller 8- by 16-inch laboratory mill, also illustrated. Here again the short vertical centers proved most economical since a conventional right-angle drive would have extended the height and the width of the machine; while an in-line drive would have extended the length of the machine. The Cone-Drive reducer used here has a 10-inch center distance and furnishes 70:1 reduction for the 15 h.p., 1800 r.p.m. motor. Because of its rugged construction, the laboratory mill can also be used for production work. Both mill units feature safety attachments, including the overhead lever or cradle-type bar mounted on brackets. The laboratory mill also has a "knee" panel knockout as an additional safety feature.

Changes at Goodrich

Chester E. Carroll, general manager of the Associated Lines sales division of The B. F. Goodrich Co., Akron, O., has retired from active business after 30 years with the organization, and M. G. Huntington has been named his successor. The latter formerly was assistant general manager of the division which handles the merchandising of the company's Brunswick, Diamond, Hood, and Miller brands of tires, tubes, accessories, and repair materials, since April, 1946. Mr. Huntington joined Goodrich in 1923 and has held many posts in the sales, advertising and sales promotion departments. He was assistant manager of the automotive, aviation and government division in the Detroit district for three years and prior to that had managed the division's office in Washington, D. C.

Mr. Carroll began with Goodrich as a salesman in the Chicago district in 1918, and served successively as manager of Diamond tire sales in the district (1919); assistant national sales manager for Diamond tires and industrial rubber products (1923); national manager of Diamond tire sales (1926); western district manager of the Associated Lines sales division (1927); assistant general manager of the division (1935); and division general manager since January, 1946.

William R. Dakan has been appointed manager of the San Francisco district of the replacement tire sales division at Goodrich, succeeding R. J. Loomis, who retires December 1, after 18 years in the San Francisco post; he has been with the company since 1912. Previously Mr. Dakan had for the last four years been regional store manager in the Pacific sales division, supervising operations of all company-owned outlets in the territory. He had joined Goodrich in 1939 as a tire salesman in the Kansas City district, became a retail supervisor there in 1937, and also served in that capacity in several other sales districts.

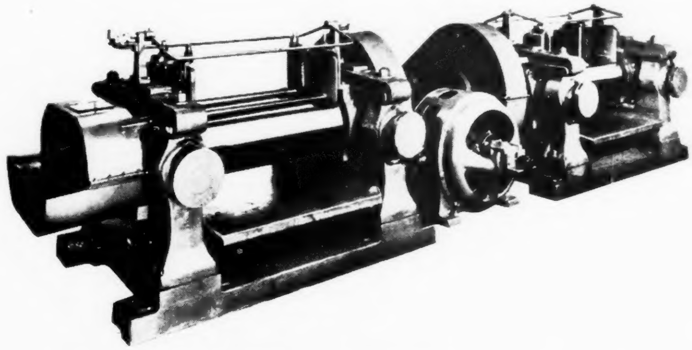
Goodrich has completed what is claimed to be the largest cylindrical closed tank ever lined with rubber in Akron. The tank has a capacity of 60,000 gallons and is 71 feet, 2½ inches long and 12 feet in diameter. Requiring the use of two railroad flatcars, the tank will be transported and mounted on a barge for use in shipping acid. The tank is the first of 20 tanks which Goodrich is lining for the chemical company operating them.

News from Koppers

Koppers Co., Inc., Pittsburgh 19, Pa. has announced that its engineering and construction division has signed an agreement with Dr. Bronislaw Goldman, Pittsburgh consulting engineer, whereby it will be able to furnish the Goldman agitator for chemical and other industrial plant installations. The Goldman agitator, recently patented in America, works on an entirely new priciple which is so efficient that mixing or washing time for chemicals is materially reduced, it is said. The agitator is so constructed that it propels liquid to the sides of the tank and upward. At the top of the tank the liquid is drawn to the center where it is pulled downward through the hollow axis upon which the agitating blades are fastened. It is expelled from the bottom of the axis to repeat the mixing process. Several installations of the Goldman agitator are now being made.

E. Y. Wolford, recently made manager of plastics development for Koppers chemical division, is responsible for new application development and customer service. With the company since 1943, Mr. Wolford early was put in charge of styrene production at the Kobuta plant, and when Koppers organized the separate chemical division two years ago, Mr. Wolford went to the division's sales development section as plastics engineer.

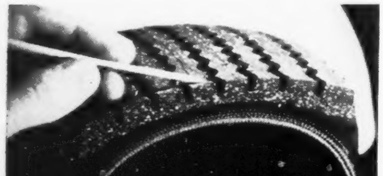
Carl H. Pottenger, assistant manager of the plastics department of American Cyanamid Co. since 1947, has accepted a position as an assistant sales manager of the Koppers chemical division. Mr. Pottenger formerly was a vice president of the Pennsylvania Coal Products Co., Petrolia, Pa., purchased by Koppers in 1947. The Petrolia plant, which manufactures resorcinol, catechol, and special adhesives, is now operated as one of five plants of the Koppers chemical division.



Adamson's Twin 60-Inch Mills with Single Cone-Drive Gearing

Firestone Developments

Firestone Tire & Rubber Co., Akron, O., has developed a new bead loosening tool that will exert a concentrated pressure up to 10,000 p.s.i. and makes possible on-the-job changes of giant earthmover tires. These huge tires weighing as much as 1½ tons each are mounted on tapered bead seat rims to prevent rim-tire slippage. After many months of use the tires freeze to the rims, and, as a result, tire changes in the past have been made on special stationary equipment often located far from the scene of operations. The new Firestone tool, adjustable for use on 20- to 33-inch rims, is compact in design and can be included with other mechanical maintenance tools in the field. In a matter of minutes, one man using the tool can easily force the steel fingers between the tire bead and the rim flange by means of a long lever arm. A mechanical screw, operated by a ratchet lever, then exerts up to five tons of pressure on the bead through the tapered fingers to force the bead away from the bead seat. The tool can be operated in either horizontal or vertical position and will loosen the outside bead of a tire while the tire is on the vehicle.



Cross-Section of Firestone's Polar Grip Tread Showing Icocel Particles

Firestone is marketing a tire tread said to make driving safer on snow and ice covered roads. This special-purpose winter tire tread, known as the Polar Grip, was thoroughly road tested last year by thousands of motorists in all parts of the country. Further improvements in rubber compounding and in construction of the tread this year make the tread outstanding for safe winter driving, it is further claimed. More than a million Icocel particles in the tread rubber provide the superior non-skid characteristics of the Polar Grip tread which can either be put on the motorist's present tires or purchased complete on new tires. In operation the Icocel particles act as an abrasive on wet and icy surfaces and, when worn away, leave tiny suction cups in the tread that grip with the roadway at all times and assure greater traction. The new tread is offered in two designs: the DeLuxe Champion for city and suburban driving, and the Studded Ground Grip for cars driving on unimproved roads and where snow and mud are heavy.

Firestone is producing new guns, developed by the Ordnance Department, which give the infantryman the striking power of field artillery. Both guns are of the bazooka type. The weight and the size of the 57-mm make it a shoulder weapon; while the 75-mm weapon fires from a standard machine-gun tripod. The new weapons embody all the principles of standard field artillery, but contain a recoilless element which makes the ponderous recoil mechanisms of field artillery no longer necessary.

Foamex, Firestone's foamed latex cushioning material, has been put to a new use in the women's bedroom scuff's manufactured by R. G. Barry Corp. These scuff's, made in three sizes and a wide range of designs, are light in weight, durable, extremely comfortable, and easily cleaned or laundered. Since Foamex is highly resilient, the soles cling to the wearer's heel in walking, and there is no flapping action.

General Tire Expanding Sales Force

General Tire & Rubber Co., Akron, O., has installed a new wholesale branch sales operation at 1725 Summit Ave., Richmond, Va., under the direction of John W. Bogle. The creation of this branch was necessitated by the increased demand for General's products in Virginia, North Carolina, and West Virginia, the states to be served by these new facilities. With more than 23,000 square feet of warehousing space the Richmond branch will carry complete stocks of all General's passenger, truck, industrial, farm tractor, and implement tires.

Mr. Bogle has been active in sales work for more than 11 years and has served as the Richmond territory sales representative for General since 1945.

Four other key staff officers have also been named for the Richmond branch: Paul J. Snyder, manager of truck tire sales; L. F. Roberts, who will direct car dealer sales; H. W. McAllister, office and operating manager; and Stuart G. Mercer, service manager. Mr. Snyder has served General accounts in the Richmond territory for more than a year; while Mr. Roberts comes to his new job from a similar assignment in Washington, D. C., and Mr. McAllister to his from a similar post in Philadelphia, Pa. Mr. Mercer is a recent graduate from General's factory trainee course.

In a move designed further to serve more adequately General Tire's expanding markets four new branch managers also have been appointed: Earl H. Schaub, Denver; Wm. W. Fergusson, Buffalo; Richard Graybill, New York; and James J. Flasco, St. Louis. Mr. Schaub, who succeeds Frank Settle, resigned, was transferred from Buffalo to Denver, in charge of sales in Colorado, Montana, Utah, Wyoming, and parts of Idaho, New Mexico, Oregon, South Dakota, and Nevada. Mr. Schaub, who spent 14 years as a territory sales representative, is succeeded in Buffalo by Mr. Fergusson, formerly territory salesman in the Binghamton-Elmira area.

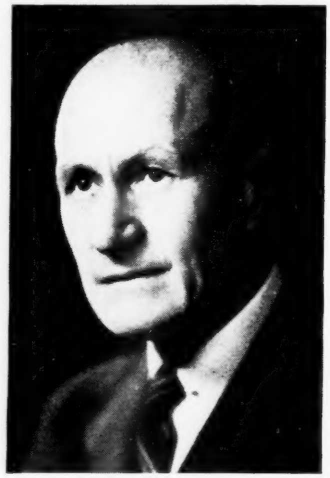
Mr. Graybill, now directing sales for New York, New Jersey, Connecticut, and part of Pennsylvania, had served as territory salesman in the Williamsport, Pa., area before moving to New York as assistant to Howard A. Bellows, head of the eastern division.

Mr. Flasco started with General Tire as an office boy 23 years ago and has served 17 years in sales, having transferred after seven years in the chemical and experimental laboratories. In his new assignment he will direct sales in portions of Kentucky, Tennessee, Arkansas, Illinois, and Missouri. Mr. Flasco replaces Frank Sibley, transferred to the company's Midwest division on a special assignment in truck tire sales.

Wm. O'Neil, president, General Tire, recently was elected to the board of trustees of the National Council for Community Improvement, 1760 K St., N.W., Washington, D. C.

Seiberling Advances Cochrun

J. L. Cochrun, vice president in charge of sales for Seiberling Rubber Co., Akron, O., has been made executive vice president and has been succeeded as vice president in charge of sales by L. M. Seiberling, formerly general sales manager. That post goes to Charles A. Reed, assistant to the president



J. L. Cochrun

Colonel Cochrun steps into a post that has been vacant for several years. The company's last executive vice president was W. A. M. Vaughan, who retired in 1945 and died a year later. Colonel Cochrun joined Seiberling at the time of the company's founding in 1921 after an army career of 13 years. He became vice president in charge of sales for the company in 1938.

These changes at Seiberling are being made to strengthen the company's administrative and sales department operations. As executive vice president, Colonel Cochrun will take over many duties in the president's office, permitting J. P. Seiberling to spend more time on "special developments, projects, and problems" requiring his attention.

L. M. Seiberling, with the company 21 years in both factory and office departments, has headed many sales departments. He was elected a director in 1947, succeeding his father, the late C. W. Seiberling, who with his brother, F. A. Seiberling, founded the company that bears their name.

Mr. Reed, was one of the first three employes on the Seiberling payroll and has been in the sales department in charge of various departments during most of his service. He was assistant sales manager before being named assistant to the president in 1945.

Opens New Branch

A new sales branch was established November 1 at Springfield, Mass., by U. S. Tires division of United States Rubber Co., Rockefeller Center, New York 20, N. Y. Located at 132 Birnie Ave., the new branch will have as its territory all of Connecticut, western Massachusetts, Vermont, and Clinton and Essex counties in New York State. Richard M. Payson has been made district manager for the branch. He joined the company as tire salesman at Boston and later became assistant district manager there.

Glenn T. Welton has been appointed manager of distributer sales for coated fabrics. He became associated with the rubber company in February, 1936, and has been a salesman of coated fabrics for nine years. In his new capacity, reporting to G. H. Callum, sales manager of coated fabrics, Mr. Welton will be responsible for the sales and merchandising through distributers of U. S. Naugahyde, Naugalite, and Royalene. His headquarters will be at the company's Mishawaka, Ind., plant.

V. A. Wibbelsman has been made manager of clothing sales, responsible for the sale of waterproof sportswear and dress raincoats as well as an extensive line of rubber surface clothing for industrial, farm, and many special groups. His headquarters are in Washington, Ind., where the company's large clothing plant is located. Mr. Wibbelsman has been with U. S Rubber in various sales positions since January, 1920.

Luther B. Martin, technical director of tire production, retired November 1 after 30 years' continuous service. Mr. Martin joined U. S. Rubber in 1918 as a chemist in the Hartford Rubber Works, Hartford, Conn.; was subsequently made laboratory superintendent at the Providence Rubber Co.; in 1923 was appointed assistant factory superintendent of the Hartford Rubber Works; was made factory manager in 1929 and in 1930 was transferred to the company's Detroit plant. Three years later he was appointed manager in charge of tire quality and in 1944 was made assistant director of tire development for the company's tire division, involving five tire and tube plants at Detroit, Eau Claire, Wis., Chicopee Falls, Mass., Los Angeles, Calif., and Indianapolis, Ind., respectively. In March, 1945, Mr. Martin was appointed director of tire development for the company, with headquarters at Detroit, which was the position he held prior to the post of technical director of tire production.

Herbert E. Smith, president of U. S. Rubber, has accepted chairmanship of the rubber division of the current United Hospital Fund Campaign in Greater New York.

Beebe Rubber Co., Nashua, N. H., according to President E. Colman Beebe, has appointed as production manager and chief chemist Richard Painter, formerly with Norwalk Tire & Rubber Co. Originally the Beebe Bros. Rubber Co., the company took its present name after the departure of John Beebe on November 1, 1947. At that time William F. Newton, formerly of Sponge Rubber Products Co., was named sales manager. In January of this year Walworth Johnson, previously with Firestone Tire & Rubber Co., was appointed superintendent. Joseph Cullen is purchasing agent for the company, and Dana Sanders is assistant chemist.

Pittsburgh Plate Glass Co., Pittsburgh 22, Pa., through Vice President E. T. Asplundh, has announced aquisition of controlling stock interest in the Midvale Coal Co. This company is being liquidated, and its mine, located near New Philadelphia, O., will be operated by Pittsburgh's Columbia Coal Division. About 60% of the mine's daily production of 2,800 tons of coal will be shipped by truck to the Barberton, O., plant of the company's Columbia Chemical Division, and the balance will be sold to regular commercial customers of the coal company, Mr. Asplundh said. Paul C. Beutel, associated with Columbia Chemical since 1936, has been appointed manager of the Columbia Coal operation, and V. L. Henry, president of the Creighton Fuel Co., will act as consultant.

Columbia Chemical has appointed Albert E. Sidwell, Jr., assistant director of research and Ralph F. Wolf manager of compounding research. Dr. Sidwell, whose associations prior to joining Columbia Chemical include ten years with the American Medical Association and four years as research instructor at the University of Chicago, will direct the division's laboratory work in inorganic and analytical fields.

Mr. Wolf, before coming to the division last January, had served two years as technical director of Standard Chemical Co., and previously had been assistant factory manager for Polson Rubber Co. During the war he was chief of the WPB synthetic rubber allocation section and before the war had been with the Standard Oil Development Co. as manager of synthetic rubber compounding research.

Assistant director of research, Franklin Strain, appointed to the position earlier this year, will continue as administrative assistant to Alphonse Pechukas, research director for the division, besides directing laboratory work in the field of organic chemistry.

Bigelow-Sanford Carpet Co., Inc., New York 16, N. Y., has announced the availability of Cushionlok, a new type of carpeting. According to President James D. Wise, the new carpet combines the quality and the beauty of conventional floor covering with the resilience of sponge rubber. The sponge rubber is blown into the rug backing, binding the tufts and rendering the carpet highly resistant to raveling. Cushionlok, it is also said, eliminates the need for any carpet underlay, and tests with a Bureau of Standards wear tester indicate that Cushionlok will substantially outlast the same carpet with conventional backing. The new carpeting can be installed, recut, reused, and repaired in the same manner as conventional carpeting.

Denman Tire & Rubber Co., Warren, O., recently redeemed 6,032 shares of its 5% cumulative convertible preferred stock, reducing the outstanding such shares to 43,133.

Consolidated Products Co., 15 Park Row, New York 7, N. Y., through Secretary M. I. Cowen, has announced the purchase of all machinery and equipment of the recently closed coated-fabrics division of Atlas Powder Co.'s Zapon plant at Stamford, Conn. Consolidated has begun an intensive campaign for liquidation of these machinery and equipment in the paint, ink, varnish, lacquer, chemical, textile, plastic coating, rubber, artificial leather, and allied industries.

General Electric Co., Schenectady, N. Y., has appointed James R. Donnalley manager of its silicone manufacturing plant at Waterford, N. Y. Dr. Donnalley came to G-E in November, 1943, in the chemical section of the research laboratory, working on fundamental silicone chemistry. In July, 1944, he was loaned to the resin and insulation materials division where he worked on pilot work for silicones and on the design of the Waterford plant. He was transferred to the chemical engineering division of the chemical department, taking charge of the Waterford group, in April, 1946.

George G. Montgomery, prominent San Francisco corporation executive, has been elected a member of the board of directors of the General Electric Co.

The Rubber Heel & Sole Manufacturers Association has changed its name to The Rubber Heel & Sole Institute, with headquarters at 551 Fifth Ave., New York 17, N. Y. The Institute has also announced the formation of the Elastic Colloid Research Corp., with an office at Avon, Mass. The Corporation is establishing a laboratory equipped with the latest experimental apparatus at Massachusetts Institute of Technology and has established a graduate fellowship in the field of elastic colloids at M.I.T. The program, under the direction of Dr. Ernest Hauser, of M.I.T., is expected to be of great value not only to heel and sole manufacturers, but also to finders and shoe repairmen. Officers of Elastic Colloid Research follow: president, R. E. Drake, Avon Sole Co.; vice president, D. R. Cutler, Alfred Hale Rubber Co.; treasurer, D. W. Bernstein, Biltrite Rubber Co.; assistant treasurer, K. L. Menuez, Gro-Cord Rubber Co.; secretary, Morris Eisen, Cat's Paw Rubber Co.; assistant secretary, R. A. Winters, Rubber Sole & Heel Institute; and director, S. Schwaber, Monarch Rubber Co.

WEST

Gates Rubber Co., Denver, Colo., one of the first large processors to receive supplies of low-temperature rubber in commercial quantities, foresees the use of this rubber in many important products other than tires. According to C. H. Mingle, director of specialized research, the improved abrasion resistance of low-temperature rubber has tremendous advantage in lengthening the service life not only of tires, but also of all other products in which abrasion or wear resistance is an important factor. Such products include V-belts, the covers of which are constantly subjected to wear against the pulley groove; many types of industrial hose; rotor tubes, stator tubes, impellers, pump cases, and other rubber or rubber-covered parts used in the mining and rock products industries; rubber-faced plates for milling and grain mills; sanding pads; and many others. Mr. Mingle also pointed out that what we have in the new low-temperature rubber is not so much a new product, but rather a whole new system of processing which is opening the door to many kinds of improvements in our so-called general-purpose synthetic rubbers.

NEWS ABOUT PEOPLE

Sid Richardson Carbon Co., Fort Worth, Tex., has appointed R. E. Carroll, Inc., Trenton, N. J., as sales representatives for the Middle Atlantic area. The Richardson company, manufacturer of channel blacks is currently producing EPC and MPC grades known as "Texas E" and "Texas M" at its plant in Odessa, Tex. R. E. Carroll, Inc. for 25 years has distributed fillers, pigments, and chemicals to the rubber, linoleum, ceramics, paints, and plastic industries.

Cruver Mfg. Co., 2460 Jackson Blvd., Chicago 12, Ill., has developed a new series of vinyl plastic playing cards employing Bakelite Corp.'s Vinylite. The new cards, it is claimed, are odorless, noninflammable, non-warping, possess exceptional "slip" which makes them easier to handle and shuffle, and have greater tear resistance and lower water absorption. The cards have a pebble grain finish which eliminates sliding on smooth tables. Guaranteed for two years by the manufacturer, the cards are available in 11 colorful designs and are merchandised in single and double-decked plastic gift boxes.

Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill., has purchased the Park Leggett Altman Co., industrial adhesive manufacturer in Minneapolis, Minn. The purchase included all assets of the firm, formulae, manufacturing processes, and equipment. Improvement of plant and technical facilities is planned, increasing distribution of Paisley starch and dextrine adhesives, animal glues, and resin emulsion cements to an expanded territory to be serviced by the new plant. The Paisley firm supplies adhesives, glues, and cements to paper mills and converters, paper box manufacturers, food packaging firms, luggage manufacturers, printers and binders, woodworking plants, and other industries. Renamed the Placo Division of Paisley Products, Inc., the new acquisition will also act as sales agents for the parent firm, Morningstar, Nicol, Inc., New York, N. Y., on the M.N.I. line of tapioca and potato starches and dextrines for food and industrial uses.

Calvert Leggett, former president of Park Leggett Altman, joins Paisley as general manager of the new division and will now have the full assistance of the Paisley New York and Chicago product development laboratories in serving the adhesive requirements of his trade.

Bacon Vulcanizer Mfg. Co., 1265 67th St., Oakland 8, Calif., this year celebrates its fortieth anniversary as a manufacturer of tire equipment.

Sid Richardson Gasoline Co., Fort Worth 2, Tex., through Sales Manager Frank Andrews, has announced the appointment of E. Q. Beckwith as manager of liquified gas sales. The company is building a large natural gasoline plant near Kermit, Tex., and present plans call for the plant to be completed and in operation by next February with a daily average production of approximately 100,000 gallons of propane and butane and 100,000 gallons of natural gasoline. Mr. Beckwith is well known in the industry, having had experience with both the Phillips Petroleum Co. and Beacon Petroleum Co., from which latter company he recently resigned as president.

W. H. Peterson has been made manager of the Chicago office of Enjay Co., Inc., chemical marketing affiliate of Esso Standard Oil Co., New York, N. Y. Sales representative for the company's rubber and plastics products in the Midwest area since joining the company in 1943, Mr. Peterson will continue in that position. He is also secretary-treasurer and 1948-49 vice chairman of the Chicago Rubber Group and a member of the membership committee of the Division of Rubber Chemistry, American Chemical Society. In 1942-43 he served as chief of the Synthetic Rubber Allocations Section of the War Production Board.

Harvey S. Firestone, Jr., chairman of The Firestone Tire & Rubber Co., Akron, O., on November 18 was awarded by the French Government the Cross of Chevalier of the Legion of Honor in recognition of outstanding service to agriculture throughout the world.

Russell S. Henderson, treasurer of Weldon Roberts Rubber Co., Newark, N. J., celebrated his twenty-fifth anniversary with the company on November 13. Throughout his years with the company, Mr. Henderson was closely associated with the late Weldon Roberts in the development of many new formulae and compounding processes for the Weldon Roberts erasers. He also played an important part in the company's research which pioneered the introduction of soft rubber abrasives into the metal industries.

Wm. C. Frendling has established Weico Rubber Mfg. Co., 1655 Euclid St., Santa Monica, Calif., with offices at 2055 E. 38th St., Los Angeles 11. Products will include small molded rubber parts and mandrel stocks, and the firm will specialize in rubber to metal bonded parts. Mr. Frendling formerly was with Muth Rubber Co., Los Angeles.

A. B. Errett, Jr., has been appointed works manager of the H. O. Canfield Rubber Co., Bridgeport, Conn. He formerly was district manager of the company's Cleveland, O. office, and a well-known consultant in the field of plastic, and molded rubber goods. Before coming to Canfield during 1946 and 1947, Mr. Errett served on the board of directors of the New England Chapter of the Society of Plastics Industry and in 1946 was also eastern sales manager of the Firestone Industrial Products Co. In 1945, Mr. Errett was product manager of the molded plastics division of the Firestone Latex & Rubber Products Co. Other positions held by Mr. Errett with Firestone include sales engineer, handling Foamex, mechanical rubber items for the automotive field and molded plastics; chief sales engineer for the Fall River plant handling molded plastics, coated fabrics, and rubber goods for Army and Navy developments. Other companies for whom Mr. Errett worked are the Firestone Tire & Rubber Co., and Armstrong Cork Co., as superintendent of mechanical rubber plant and general superintendent of the Armstrong Cork rubber plant, manufacturing druggists' sundries, industrial products, and rubber tile.

Ray H. Anders has been made director of purchases of Sun Oil Co., Philadelphia, Pa., to succeed Henry Thomas, who retired December 1 after 36 years of service. Mr. Anders, until recently manager of the company's industrial products department, will be assisted in his new capacity by Roy A. Hurst, assistant director of purchases. Mr. Anders, who joined Sun in 1929, at one time had been Allentown, Pa., manager of The B. F. Goodrich Co.

Edward M. Frick, well known in the upholstery field for his many years of service and achievement in the industry, has been appointed to a position in the sales department of the Pantasote Co., Passaic, N. J., manufacturer of proofed goods.

Gilbert Thiessen, formerly development manager of the chemical division, Koppers Co., Inc., Pittsburgh, Pa., has been named technical adviser for that division. He will devote his time to the coordination and advisory direction on technical matters relating to the development, sale, and use of products produced or to be produced in plants of the division. Shortly before completion of his graduate work, Dr. Thiessen joined a subsidiary of Koppers. In 1931 he accepted a position with the Illinois State Geological Survey, but returned to Koppers in 1937, working in the technical department of the tar and chemical division. When the company formed a separate chemical division in October, 1946, Dr. Thiessen was made manager of the development section of the division.

Charles N. Woodbury, assistant export manager of Hood Rubber Co., Watertown, Mass., a division of The B. F. Goodrich Co., retired November 1 after 45 years' service. He started in the production department in 1904 and served briefly as manager of orders before joining the export division in 1918.

Leonard Maclean has joined Goodall Fabrics, Inc., 525 Madison Ave., New York, N. Y., as a special sales promotion representative, according to Fred L. Ford, sales manager of the coated fabrics and plastic division. Mr. Maclean for 20 years has sold to manufacturing fields where coated fabrics are used, covering the eastern states and specializing in the development, styling, and sale of pyroxylin and plastic coated material. His previous connections were with Keratol Co., and the Zapon-Keratol Division of Atlas Powder Co.

Louis F. Vauthier, sales manager (tires division) of Dominion Rubber Co., Ltd., and for many years active in the work of the Province of Quebec Society for Crippled Children, recently was elected president of the Kiwanis Club of Montreal.

Ralph K. Guinzburg, president of I. B. Kleinert Rubber Co., New York, N. Y., is chairman of the rubber division in the 1948 fund drive for the Travelers Aid Society of New York.

Benjamin W. Lewis has been appointed vice president of the Witco Chemical Co. in charge of western sales of the manufactured products division. Mr. Lewis, who has been with Witco for 22 years, has been active in technical development and sales promotion during that period. The list of manufactured products under his supervision includes metallic stearates, paint driers, sunolite wax, rust preventatives, and other manufactured items. His headquarters are in the Witco offices in the Tribune Tower, Chicago, Ill.

Charles W. Bayley, Jr., has been in Malaya representing General Latex & Chemical Corp., Cambridge, Mass., at the plantations of Harrisons & Crosfield, Ltd., for whose latex General Latex recently was named exclusive distributer in the United States. Mr. Bayley is establishing the latest American standards and methods of testing normal and centrifuged latex and is assisting in formulating a long-term research program in the shipping of latex and the development of new and better latices. Mr. Bayley, a staff member of the Cambridge concern since June, 1941, except for his period of war service, is expected back in this country this month.

P. H. Goodall, assistant to the president, The Mohawk Rubber Co., Akron, O., retired November 1 after 44 years in the business. Starting at the Hartford Rubber Works Co. in 1904, which later was taken over by United States Rubber Co., Mr. Goodall moved up through the ranks to the position of district manager before he joined Mohawk as assistant sales manager. Then in 1944 he became assistant to the president, under R. E. Bloch. Mr. Goodall plans to spend his winters in Florida and his summers in Cleveland.

John W. Snyder, technical director of Binney & Smith Co., New York, N. Y., recently returned from a three-week air trip to Europe, where he conducted a technical service survey of the rubber, paint, and ink industries in England and France.

A. Boyd Cornell was elected a director at the recent stockholders' meeting of Acme-Hamilton Mfg. Corp., which operates Acme Rubber Mfg. Co. and Hamilton Rubber Mfg. Corp., all of Trenton, N. J. Mr. Cornell has been identified with various business and civic activities for a number of years. He is executive vice president of the Hamilton company, with which he has been connected since 1918.

Samuel B. Ellis has been made director of export sales of Hamilton Rubber Mfg. Corp., Trenton, N. J. Under his supervision Hamilton Rubber plans to increase extensively its foreign sales of mechanical rubber goods. Mr. Ellis will make his headquarters at the company's New York, N. Y., office, Woolworth Bldg., 233 Broadway. Mr. Ellis has had wide experience in foreign marketing and lived in Shanghai, China, from 1922-1930, where he was engaged in the general importing business. In 1930 he joined The Goodyear Tire & Rubber Export Co., Akron, O., where he became manager of mechanical goods sales and traveled extensively abroad. In 1943 he went to United States Rubber Export Co., Ltd., New York, in a similar capacity.

CALENDAR

Dec. 28.	Washington Rubber Group.
Jan. 4.	Chicago Section, SPE. Merchants & Manufacturers Club, Chicago, Ill.
Jan. 5.	Western New England Section, SPE. Hotel Sheraton, Springfield, Mass.
Jan. 10-14.	SAE. National Meeting and Engineering Display. Hotel Book-Cadillac, Detroit, Mich.
Jan. 11.	New York Section, SPE. Hotel Sheraton, New York, N. Y.
Jan. 12.	Newark Section, SPE. Newark AC, Newark, N. J.
Jan. 12.	Rhode Island & Southeast Massachusetts Section, SPE. Providence Engineering Societies Bldg., Providence, R. I.
Jan. 12-14.	SPI Reinforced Plastics Division. Fourth Annual Technical Session and Exhibit. Edgewater Beach Hotel, Chicago, Ill.
Jan. 18.	Buffalo Rubber Group, Westbrook Hotel, Buffalo, N. Y.
Jan. 19-21.	Society of Plastics Engineers. Annual Conference. Bellevue-Stratford Hotel, Philadelphia, Pa.
Jan. 22-28.	National Manufacturers & Jobbers Sports Exhibition. New Coliseum, Chicago, Ill.
Jan. 25.	Washington Rubber Group.
Jan. 28.	Buffalo Section, SPE. Westbrook Hotel, Buffalo, N. Y.
Jan. 29-Feb. 4.	National Sporting Goods Association. Annual Convention and Show. Ambassador Hotel, Atlantic City, N. J.
Feb. 1.	The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.
Feb. 1.	Chicago Section, SPE. Merchants & Manufacturers Club, Chicago, Ill.
Feb. 2.	Western New England Section, SPE. Hotel Sheraton, Springfield, Mass.
Feb. 4.	Chicago Rubber Group. Hotel Morrison, Chicago, Ill.
Feb. 8.	New York Section, SPE. Hotel Sheraton, New York, N. Y.
Feb. 9.	Newark Section, SPE. Newark AC, Newark, N. J.
Feb. 9.	Rhode Island & Southeast Massachusetts Section, SPE. Providence Engineering Societies Bldg., Providence, R. I.
Feb. 15-16.	Society of the Plastics Industry of Canada. Seventh Annual Conference. Niagara Falls, Ont., Canada.
Feb. 18.	Akron Rubber Group. Winter Meeting. Mayflower Hotel, Akron, O.
Feb. 19-27.	National Sportsmen's Show. Grand Central Palace, New York, N. Y.
Feb. 21-23.	National Sporting Goods Association of Canada. Annual Meeting. General Brock Hotel, Niagara Falls, Ont., Canada.
Feb. 25.	Buffalo Section, SPE. Westbrook Hotel, Buffalo, N. Y.
Feb. 28-Mar. 4.	ASTM. Spring Meeting and Committee Week. Hotel Edgewater Beach, Chicago, Ill.
Mar. 1.	Chicago Section, SPE. Merchants & Manufacturers Club, Chicago, Ill.
Mar. 1.	The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.
Mar. 2.	Western New England Section, SPE. Hotel Sheraton, Springfield, Mass.

Samuel Broers, president of Firestone International Co., Akron, O., on a two-month business tour of the Southwest Pacific attended the formal opening of Firestone's new tire plant at Papanui, near Christchurch, New Zealand, October 29. The first tire factory to be built in New Zealand, the Papanui plant already has begun producing tires for motorists in that country and throughout the Southwest Pacific region. A staff of New Zealanders has been trained to handle production at the new unit. Mr. Broers, in charge of Firestone's export operations for the last 26 years, visited Honolulu, New Zealand, and Australia, conferring with Firestone distributers.

Edward F. Kirik has become general sales manager of The Bond Rubber Corp., 326 Derby Ave., Derby, Conn., manufacturer of molded rubber specialties. Mr. Kirik previously had been sales engineer for the H. O. Canfield Co.

Robert L. Westbee has been assigned to the general managership of the recently created electrical insulation and sound recording tape division of Minnesota Mining & Mfg. Co., St. Paul, Minn. He was formerly sales manager for electrical tapes with the company.

OBITUARY

Mrs. Edward Lyman Bill

MRS. CAROLINE L. BILL, widow of the late Col. Edward Lyman Bill, founder of the publishing company which is now Bill Brothers Publishing Corp., and with which India RUBBER WORLD is affiliated, died at her country home in Lyme, Conn., on November 3 after a long illness.

Mrs. Bill was born in 1861 and was one of the oldest living graduates of Colby College. In 1916, upon the death of her husband, she succeeded him as president of Edward Lyman Bill, Inc., a position which she held for 17 years, until the formation of the present firm. She continued an active force in its direction until a few years ago.

A resident of New Rochelle for half a century, she was a prominent figure in its civic and philanthropic activities.

Mrs. Bill is survived by two sons, Raymond and Edward Lyman Bill, chairman of the board and president of Bill Bros. Publishing Corp., respectively; a daughter, Mrs. Randolph Brown, wife of Randolph Brown, vice president of the company; a sister; and five grandchildren.

Funeral services were held at the First Congregational Church of Hamburg, Conn., on November 5, followed by interment in Lyme, Conn.

Raymond Tait MacLaren, 45, salesman for Pennsylvania Rubber Co., in southern Michigan, died of a heart attack in Detroit on November 6. Mr. MacLaren, with Pennsylvania Rubber for three years, is survived by his wife, and a son.

Patents and Trade Marks

APPLICATION

United States

2,450,659. **In an Infant's Diaper with Disposable Inserts, a Resilient Wall Extending around a Pad-Receiving Area and an Overlay of Impervious Material for this Area.** F. K. Rickerson, assignor of one-fourth to A. Lobe, both of Seattle, Wash.

2,450,225. **Dropper with an Air-Compressing Element.** G. Bernabo, Buenos Aires, Argentina.

2,450,250. **Rubber Tread Lift in a Hinged Heel Shoe.** J. R. Napton, Marshall, Mo.

2,450,259. **Aircraft Wheel and Tire.** A M. Stanley, Lynn, Mass.

2,450,329. **Pneumatic Timing Switch for Electric Circuits, Including a Normally Inflated, Compressible Bulb of Non-Conducting Material.** E. C. Deane, North Kansas City, Mo.

2,450,510. **Rubber Gasket Ring Adapted to Be Interposed between a Conventional-Type Milk Strainer and an Associated Milk Can.** P. P. Hanson, Pocahontas, Iowa.

2,450,576. **Power Transmission Belting, Including a Number of Hollow Semi-Cylindrical Portions of Flexible Sheet Material Arranged Side by Side with Their Axes Parallel to Form a Strip.** H. Brammer, Leeds, England.

2,450,694. **In a Self-Locking Nut Having Means Providing a Recess for Locking Material, a Body of Locking Material Including a Synthetic Linear Superpolymer of a Diamine and a Dibasic Acid in the Recess.** J. A. Sauer, Elizabeth, assignor to Elastic Stop Nut Corp. of America, Union, both in N. J.

2,450,699. **Pneumatic Mattress.** H. O. Veach, Los Angeles, Calif.

2,450,749. **Garden Tractor, Including Tired Wheels.** D. H. Clark, Stockton, Calif.

2,450,919. **In a Powder Applicator, a Body of Thick, Pliable Rubber with a Pocket for Holding Powder.** G. D. Runnels, Seattle, Wash.

2,450,968. **Stocking Protector.** B. B. Knubel, Westport, Conn.

2,451,075. **In a Milk Receiver for Automatic Milking Systems, a Relatively Stiff, but Resilient, Removable Sleeve.** J. J. De Carli, Stockton, Calif.

2,451,126. **For Use in Making Templates, a Translucent Sheet of Polyvinylidene Chloride Mixed with Glass Fibers.** R. B. Stringfield, Los Angeles, Calif., and T. R. Miles, Fort Worth, Tex., assignors to Consolidated Vultee Aircraft Corp., San Diego, Calif.

2,451,172. **Cushion Tire for Vehicles.** H. C. Nies, Passaic, N. J.

2,451,194. **Adhesive-Containing Suction Cup of Resilient Material.** F. C. Braun, New York, N. Y.

2,451,234. **In Combination with the Barrel of a Percussive Tool Having a Power Operated Hammering Piston Reciprocable Therein, Bumper Means in the Form of a Mass of Resilient Material.** W. G. Mitchell, Aurora, assignor to Independent Pneumatic Tool Co., Chicago, both in Ill.

2,451,276. **Valve Core, Including a Barrel, a Valve Pin Movable through the Barrel, and a Valve Member of Rubber-Like Material Mounted on the Pin.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.

2,451,326. **Rubber-Like Cushioning Pad in a Brake Shoe Assembly.** C. L. Eksergian and P. W. Gaenssle, both of Detroit, Mich., assignors to Budd Co., Philadelphia, Pa.

2,451,329. **Rubber-Cushioned Disk Brake Shoe Assembly.** P. W. Gaenssle, Detroit, Mich., assignor to Budd Co., Philadelphia, Pa.

2,451,438. **The Combination with a Sleeve and a Member Which It Embraces Having a Shoulder Adjacent the End of the Sleeve of a Fastening Device, Including a Partial Ring of Resilient Material Embracing the Sleeve.** R. A. Hartman, assignor to Tinnerman Products, Inc., both of Cleveland, O.

2,451,474. **Dual-Tube Pneumatic Life Preserver Belt.** E. C. Craig, United States Navy.

2,451,475. **Dual-Tube Pneumatic Life Preserver Belt.** E. C. Craig and L. A. Straits, both of the United States Navy.

2,451,685. **In a Boxing Glove, a Flexible Outer Casing and Resiliently Elastic and Relatively Unattached Members Enclosed in the Casing to Provide a Padding for the Glove.** E. S. Mollanen, Oakland, Calif.

2,451,697. **Form-Fitting Seamless Undergarment of Knitted Elastic Yarn.** M. Speicher, St. Louis, Mo.

2,451,699. **In a Support Bracket for Cylindrical Objects, Including Circular Enlargements in Grooves in the Bracket, Soft Resilient Grommet-Shaped Centrally Split Sleeves Seatable in the Enlargements.** S. E. Twaroski, Los Angeles, Calif.

2,451,753. **Abrasive Wheel with Flexible Resilient Rim.** M. E. Landau, Brooklyn, N. Y.

2,451,758. **Ventilated Rubber Glove.** H. Malm, New York, N. Y.

2,451,762. **Flexible, Resilient Packing Ring.** C. V. Millikan, Tulsa, Okla., assignor to Geophysical Research Corp., New York, N. Y.

2,451,791. **In a Universal Joint, Including a Pair of Yokes Each Having a Cylindrical Bearing Bore in Which Cylindrical Bearing Blocks Are Insertable, a Rubber-Like Flexible Constricting Retaining Member Surrounding Each Yoke to Center the Bearing Blocks within Their Respective Bores.** E. W. Weaver, Cleveland Heights, O., assignor to Towmotor Corp., Cleveland, O.

2,451,855. **In a Boat, Including Keel and Deck Frames Enclosed in an Inextensible Flexible Skin Forming the Outer Walls of the Boat, Longitudinally Disposed Inflatable Members below the Deck Frame and within the Skin.** P. E. Mercier and R. Villers-Allerand, New York, N. Y.; Mercier assignor to Villers-Allerand.

2,451,894. **Steel Reinforced Tire.** H. K. Weed, Blakeley Island, Ala.

2,451,911. **Liquid - Hydrocarbon - Resistant Container Including Sheets of Ethylene-Dichloride-Polysulfide Plastic Coated on at Least One Side with Successive Layers of Mixed Ethylene Dichloride Polysulfide Plastic and Polymerized Chlorobutadiene of Diminishing Ethylene Dichloride Polysulfide Plastic Content, and a Final Overlapping Coat of Polymerized Chlorobutadiene.** V. N. Braden, assignor to Wingfoot Corp., both of Akron, O.

2,451,929. **In an Innersole Made up of Top, Bottom, and Intermediate Layers, a Bottom Layer of Smooth Perforated Plastic Material.** A. L. Dorgin, New York, N. Y.

2,451,980. **Resilient Cushions between Leg and Foot Portions of an Artificial Leg.** S. B. Samons, Sr., River Rouge, Mich.

2,452,057. **Leakproof Coupling of Flexible Material.** J. W. Kehoe, Wauwatosa, Wis.

2,452,103. **Inflatable Headrest.** J. A. and R. J. Conradt, both of Rochester, N. Y.

2,452,174. **Commercial Package, Including Fruit Enclosed in a Container Consisting of Two Hemispherical, Preformed, Form-Retaining Halves Made of Strong, Flexible, Transparent Material Capable of Withstanding Handling and Shipment by Mail.** F. B. Arnold, New York, N. Y.

2,452,181. **Elastic Sanitary Napkin Holding Means.** E. Carpenter, Chicago, Ill.

2,452,225. **Unitary Hair Curling Device of Molded Rubber.** P. T. Coloccia, Hillside, N. J.

2,452,228. **Parachute Shroud, Including a Braided Jacket and a Rubber-Elastic Core, which Includes a Bundle of Parallel Elastic Threads Firmly Bound together at Opposite Ends of the Core.** R. T. Dawes and F. Taylor, both of Hudson, Mass.

2,452,466. **In a Sealing Tip for Use on Well Casings for Sealing Holes in Bed Rock, a Short Pipe Section and an Annular Resilient Rubber Sealing Member.** R. Jaswell, Smithfield, R. I.

Dominion of Canada

417,244. **Puncture Sealing Gas Tank.** E. Eger, Grosse Point Park, Mich., U.S.A., assignor to Dominion Rubber Co., Ltd., Montreal, P.Q.

451,474. **Spinning Apron of Layers of Nylon Cord and Rubber.** H. M. Bacon and J. Rockoff, assignors to Dayton Rubber Mfg. Co., all of Dayton, O., U.S.A.

451,490. **Vehicle Tire.** E. C. Woods, Gravesend, Kent, assignor to Henley's Tire & Rubber Co., Ltd., Dorking, Surrey, both in England.

451,515. **Heat Insulating Laminated Plastic Cover for Refrigerating Units.** B. Jaffe, assignor to St. Regis Paper Co., both of New York, N. Y., U.S.A.

451,552. **Water Pistol, Including a Collapsible Liquid Reservoir Attached to the Pistol Barrel.** J. P. Gowland, Woking, Surrey, England.

451,558. **In a Centrifugal Hydraulic Clutch, Including a Drive Shaft, an Expansible Rubber Tube surrounding the Shaft and Having a Base Portion Attached thereto.** J. B. Kirby, Everett, O., U.S.A.

451,601-603. **Textile Fiber Drafting Element with a Working Surface of Synthetic Rubber Modified with Glue.** J. W. Baymiller, assignor to Armstrong Cork Co., both of Lancaster, Pa., U.S.A.

451,622. **Resin Covered Wire or Cable.** J. E. Brister, Summit, and C. J. Burch, Plainfield, both in N. J., U.S.A., assignors to Carbide & Carbon Chemicals, Ltd., Toronto, Ont.

451,677. **Electric Power Cable.** C. E. Bennett, Ridgewood, assignor to Okonite-Callender Cable Co., Inc., Paterson, both in N. J., U.S.A.

451,758. **Liquid Supply System, Including an Air Pressure Tank within Which Is Disposed an Elastic Inflated Compressible Pouch.** V. L. Tannehill, Fort Wayne, Ind., U.S.A.

451,882. **Liquid Fuel Tank for Aircraft and Other Vehicles, Having a Fuel Retaining Wall of Neoprene, and a Protective Self-Sealing Layer of a Slow Vulcanized Rubber Composition.** B. Wilkinson, London, and K. McK. le Good, Camberley, assignors to Imperial Chemical Industries, Ltd., London, both in England.

451,883. **Fuel Tank, Including a Removable Bag Impervious to the Action of Fuel within a Flexible Outer Self-Sealing Covering.** B. Wilkinson, London, and K. McK. le Good, Camberley, assignors to Imperial Chemical Industries, Ltd., London, both in England.

451,959. **In a Machine for Coated Confections, an Endless Resilient Membraneous Belt.** C. E. Faxon, Maywood, Calif., U.S.A.

451,995. **In a Shock Absorbing Unit, a Base Member, a Top Member, a Block of Rubber under Compression on the Top Member, and a Mass of Rubber under Shear between the Members.** D. F. Sproul, Chicago, Ill., U.S.A., assignor to Canadian Cardwell Co., Ltd., Montreal, P.Q.

452,026. **In a Process for Preserving Perishable Foodstuffs, a Seamless Envelope of Unvulcanized Rubber Conforming to the General Shape of the Foodstuff and Exerting Compacting Tension thereon.** H. M. J. T. de Poix, Rueil, Seine-et-Oise, France, assignor to Dewey & Almy Chemical Co. of Canada Ltd., Villa La Salle, P. Q.

452,031. **Composite Sheet Material Including a Layer of Steel Filaments Embedded in Rubber and Positioned between Two Lengths of Fabric.** W. G. Gorham and J. Graham, both of Manchester, England, assignors to Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

452,034. **Brassiere with an Under-Breast Band with Elastic Sections.** I. Rosner, Forest Hills, L. I., assignor to Even-Pul Foundations, Inc., New York, both in N. Y., U.S.A.

452,091. **In a Resilient Bolster Supporting Unit Including Upper and Lower Followers and Friction Shoes, a Fusiform Block of Rubber Arranged Coaxially with the Followers and Engaging the Shoes.** D. F. Sproul, assignor to J. R. Cardwell, both of Chicago, Ill., U.S.A.

United Kingdom

608,122. **Sealing Closures for Adjacent Margins.** B. F. Goodrich Co.

608,127. **Adhesive Sheets and Tapes.** Johnson & Johnson (Gt. Britain), Ltd.

608,147. **Electric Cables.** R. C. Mildner.

608,198. **Soles for Footwear.** Combined-Rubber Co., Ltd., and K. Reich.

608,332. **Elastic Fabrics.** E. I. du Pont de Nemours & Co., Inc.

608,505. **Apparatus for Preventing the Accumulation of Ice on an Airfoil.** B. F. Goodrich Co.

608,615. **Resilient Wheels, Especially for Handtrucks.** G. and C. Slingsby.

608,622. **Rubber Cushioning Device and Rubber Cushioning Elements Adapted for Use therein.** N. Sluyter.

609,007-008. **Resilient Shock Absorber.** Dowty Equipment, Ltd.

609,189. **Plastic Moldings with Metal Inserts.** A. Benn and H. G. Allen.

609,209. **Inflatable Core for Molding Perforations in Concrete, Mortar, Pottery, Etc.** A. Semeraro.

609,367. **Composite Material for Electric Insulating and Other Purposes.** British Insulated Callender's Cables, Ltd., and H. E. Kretschmer.

609,419. **Tire Casing Patch.** General Tire & Rubber Co.

609,426. **Shock-Absorbing Buffer.** Dunlop Rubber Co., Ltd., G. W. Trobridge, and P. J. Bawcutt.

609,468. **Insulated Electrical Conductor.** United States Rubber Co.

609,473. **Tractor and Like Wheels.** Andre Rubber Co., Ltd., and T. Gillett.

Butaprene* NL is the Preferred Polymer in the MEDIUM ACRYLONITRILE GROUP

Here's Why:

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- ★ GOOD TENSILE STRENGTH
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No polymer in the 26% acrylonitrile group can equal Butaprene NL for easy processing. It handles perfectly on mills, calenders and extruders. But that's not all — you get good tensile, elongation and flexibility—all very necessary properties in a fuel-and-oil resistant elastomer.

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AMERICA'S *most* VERSATILE ELASTOMER

CHEMICAL

United States

2,449,970. **Stabilizing a Solid Terpene Polymer by Contacting with Iodine.** J. N. Borglin, assignor to Hercules Powder Co., both of Wilmington, Del.

2,449,987. **Bringing together in Aqueous Solution Beta-Propiolactone and a Water-Soluble, Ionizable, Inorganic Salt of a Hydracid, and Then Acidifying the Solution to Prepare a Beta-Substituted Propionic Acid.** T. L. Gresham, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,449,988. **Preparation of Polycarboxylic Acids.** T. L. Gresham, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,449,989. **Preparation of Beta-Thio Carboxylic Acids.** T. L. Gresham, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,449,990. **Preparing a Salt of a Beta-Acyloxy Carboxylic Acid.** T. L. Gresham and J. E. Jansen, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,449,991. **Bis (3-Chloro-4-Beta-Carboxyethoxyphenyl)** Dimethyl Methane. T. L. Gresham and F. W. Shaver, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,449,992. **Preparation of a Beta-Thio Carboxylic Acid.** T. L. Gresham and F. W. Shaver, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,449,993. **Preparation of a Beta-Halo Propionic Acid.** T. L. Gresham and F. W. Shaver, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,449,994. **Preparing a Beta-Acyloxy Acyl Halide.** T. L. Gresham and F. W. Shaver, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,449,995. **Preparing an Alkyl Ester of an Alpha-Beta Unsaturated Carboxylic Acid.** T. L. Gresham and F. W. Shaver, Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,449,996. **Preparation of Beta-Thio Dipropionic Acid.** T. L. Gresham and F. W. Shaver, Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,450,000. **Polymerization of an Aqueous Dispersion, Including, as Sole Polymerizable Component, Methyl Methacrylate, and a Vinyl Compound and a Thiol.** B. W. Howk, Wilmington, and F. L. Johnston, Claymont, assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,450,027. **Production of Substantially Pure Dimers of Alpha-Alkyl Para-Alkyl Styrenes with the Aid of Activated Fuller's Earth.** A. J. Warner, South Orange, and T. H. Talbot, East Orange, both in N. J., assignors to Federal Telephone & Radio Corp., New York, N. Y.

2,450,028. **Rubber-Like Material Including the Emulsion Polymerization Product of Para-Methyl-Alpha-Methyl-Styrene and Butadiene.** K. H. Weber, Lancaster, and P. O. Powers, Manheim Township, assignors to Armstrong Cork Co., Lancaster, both in Pa.

2,450,101. **For Use in the Manufacture of Ear Defenders and the Like, a Composition 100 Parts by Weight of Polychloroprene, 4 Magnesia, 1.5 Stearic Acid, 0.5 Diorthotolylguanidine Salt of Dicatechol Borate, 12 Titanium Dioxide, 3 Paraffin, 20 Lanolin, and One Zinc Oxide.** P. S. Veneklasen and N. A. Watson, both of Los Angeles, Calif., assignors to the United States of America.

2,450,116-118. **Preparation of Beta-Lactones.** J. R. Caldwell, Kingsport, Tenn., assignor to Eastman Kodak Co., Rochester, N. Y.

2,450,119. **Isomerization of Pinene to Camphene.** W. F. Carson, Jr., Brunswick, Ga., assignor to Hercules Powder Co., Wilmington, Del.

2,450,131-134. **Preparation of Beta-Propiolactone.** H. J. Hagemeyer, Jr., Kingsport, Tenn., assignor to Eastman Kodak Co., Rochester, N. Y.

2,450,171. **Friction Material, Including Asbestos Fiber, Dried and Ground Tung Pomace and Resin.** T. R. Stenberg, Troy, N. Y., assignor to Bendix Aviation Corp., South Bend, Ind.

2,450,234. **Production of an Allyl Polyether of a Polyglycerol by Bringing Stannic Chloride into Contact with Allyl Glycidyl Ether in the Presence of an Organic Solvent under Anhydrous Conditions.** T. W. Evans and E. C. Shokal, both of Oakland, assignors to Shell Development Co., San Francisco, both in Calif.

2,450,272. **Plasticizable Organic Compounds Plasticized with an Alkoxyalkyl Ether of a Halonitrophenol.** G. L. Doelling, St. Louis, and K. H. Adams, Fenton, assignors to Mississippi Valley Research Laboratories, Inc., St. Louis, both in Mo.

2,450,327. **Heat-Resisting Coating Composition, Including a Partially Hydrolyzed Lower Alkyl Ester of a Silicic Acid, Finely Divided Mica, Water, and a Heat-Resistant Corrosion-Inhibitive Inorganic Pigment.** H. D. Cogan, Glenshaw, Pa., and N. H. Ketcham, Flushing, N. Y., assignors to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,450,384. **Manufacturing Factice by Reacting Sulfur with a Fatty Oil at between 130 and 180° C. in the Presence of Dicyclohexylamine.** K. C. Roberts, Clayton, assignor to Anchor Chemical Co., Ltd., Manchester, both in England.

2,450,408. **For a Lap-Resistant Textile Fiber Drafting Element, a Working Surface Including the Reaction Product of a Free Halogen and a Vulcanized Synthetic Polymerization Product of an Open-Chain Aliphatic Conjugated Diene.** J. W. Baymiller, Manheim Township, assignor to Armstrong Cork Co., Lancaster, both in Pa.

2,450,409. **Lap-Resistant Roll Cover Having a Working Surface of Butadiene Acrylonitrile Copolymer in Which Is Dispersed Glue.** J. W. Baymiller, Manheim Township, assignor to Armstrong Cork Co., Lancaster, both in Pa.

2,450,410. **Lap-Resistant Roll Cover with a Working Surface Made of a Modified Synthetic Rubber.** J. W. Baymiller, Manheim Township, assignor to Armstrong Cork Co., Lancaster, both in Pa.

2,450,416. **Polymerization in Aqueous Emulsion of a Conjugated Butadiene Hydrocarbon in the Presence of an Alkali Metal Salt of Hydroxytetrahydroabietic Acid.** J. N. Borglin, assignor to Hercules Powder Co., both of Wilmington, Del.

2,450,424. **Moldable Reaction Products of Sulfur Dioxide and 2-Butene.** F. E. Frey, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Del.

2,450,435. **Resinous Composition, Including a Polymer of Vinyl Chloride and a Plasticizer Mixture Consisting of a Dioctyl Phthalate and Liquid Petrolatum.** A. J. McGillicuddy, Spokane, Wash., assignor of one-fifth to B. H. Levenson, Washington, D. C., and two-fifths to F. L. Towne, or his wife, B. Towne, Spokane, Wash.

2,450,436. **Cellular Thermoplastic Products.** O. R. McIntire, assignor to Dow Chemical Co., both of Midland, Mich.

2,450,451. **Polymerization of Ethylene in the Presence of an Organic Peroxide Catalyst and a Saturated Hydrocarbon Diluent and a Metal from the Group of Magnesium, Zinc, Cadmium, and Mercury.** L. Schmerling, Riverside, assignor to Universal Oil Products Co., Chicago, both in Ill.

2,450,457. **Coagulating an Unfrothed Coagulable Fluid into Permanent Form.** T. A. Te Grotenhuis, Olmsted Falls, assignor to the General Tire & Rubber Co., Akron, both in O.

2,450,503. **Providing a Surface with a Tough Resinous Coating, Including Depositing a Mixed Spray of Atomized Styrene and Atomized Stannic Chloride.** F. E. Drummond, Westfield, N. J., assignor to Chemical Developments Corp., Dayton, O.

2,450,547. **Continuous Process for Producing a Dispersed Solid Polymer.** P. J. Gaylor, Union County, N. J.

2,450,552. **Controlling Polymerization of Polyhydric Alcohol Esters of Alpha-Olefinic Dicarboxylic Acids with Ethylenic Monomers.** E. C. Hurdis, Passaic, N. J., assignor to United States Rubber Co., New York, N. Y.

2,450,578-579. **Preparation of Aqueous Dispersions of Synthetic Rubbers.** C. F. Brown, Bethany, W. Va., assignor to United States Rubber Co., New York, N. Y.

2,450,594. **Copolymeric Organo-Siloxane Including Organo-Silicon Units Corresponding to the Formulae $CH_3SiO_{3/2}$ and $RSiO_{3/2}$, Respectively, Where R Is an Alkyl Radical Having 12 to 18 Carbon Atoms; the Units Are Joined by Their Oxygen Atoms.** J. F. Hyde, assignor to Corning Glass Works, both of Corning, N. Y.

2,450,658. **Thiophene.** R. C. Hansford and H. E. Rasmussen, both of Woodbury, N. J., C. G. Meyers, Bryn Mawr, Pa., and A. N. Sachanen, Woodbury, N. J., assignors to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,450,685-687. **Alkyl Derivatives of Thiophene.** H. E. Rasmussen and R. C. Hansford, both of Woodbury, N. J., assignors to Socony-Vacuum Oil Co., a corporation of N. Y.

2,450,771. **Vulcanizable Plastic Substance Containing Unsaturated Carbon to Carbon Bonds and a Vulcanizing Agent Which Is a Stable Plastic Sulfur Composition Obtained by Subjecting to Elevated Temperature a Mixture Including a Hydrocarbon or Partially Halogenated Hydrocarbon, Oxygen and a Hydrogen Sulfide or Mercaptan.** W. E. Vaughan, Berkeley, and B. Barnett, assignors to Shell Development Co., both of San Francisco, both in Calif.

2,450,902. **For Decorating Glass Fabrics, a Composition Including a Pigment Dispersed in a Vehicle Including a Heat Convertible Resin Prepared from Formaldehyde, a Substance from the Group of Carbamide, Melamine, Biuret, Guanidine and Dicyanodiamide, and a Vinyl Chloride-Vinyl Acetate Interpolymer.** C. M. Marberg, Elmhurst, L. I., assignor to Interchemical Corp., New York, both in N. Y.

2,450,940. **Polyamides from Polymeric Fat Acids.** J. C. Cowan, L. B. Falkenberg, and H. M. Teeter, Peoria, and P. S. Skell, Urbana, Ill., assignors to the United States of America, as represented by the Secretary of Agriculture.

2,451,040. **Butadiene.** E. V. Murphree, Summit, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,451,153. **New Resinous Condensation Products Obtained by Heating together in the Presence of an Acidic Condensing Agent (1) a Soluble Melamine-Formaldehyde Condensation Product Etherified with a Monohydric Alcohol, and (2) a Soluble Phenol-Formaldehyde Condensation Product Etherified with a Monohydric Alcohol.** W. Charlton and J. B. Harrison, Blackley, Manchester, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,451,173. **A Rubber-Like Polymer Obtained by Polymerizing a Hydroxy-Acetylated Tall Oil by Heat Condensation in the Presence of an Esterification Catalyst Serving as a Catalyst for the Reaction.** R. Richter, Irvington, and J. J. Miskel, Brooklyn, both in N. Y., assignors to Nopco Chemical Co., a corporation of N. J.

2,451,174. **Vulcanizing a Plasticized Vinyl Polymer by Incorporating Polymerized 2,2,4-Trimethyl Dihydroquinoline and Heating at 300 to 350° F.** L. F. Reuter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,451,177. **Curing a Plastic Polymer of a Saturated Aliphatic Monohydric Alcohol Ester of Acrylic Acid by Heating with an Oxide of Lead.** S. T. Semegen, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,451,178. **Curing a Polymer of an Alkyl Ester of Acrylic Acid by Heating with a Solid Alkali Metal Hydroxide.** S. T. Semegen, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,451,180. **Accelerating the Emulsion Polymerization of Butadiene-1,3 Hydrocarbons by Adding a Simple Ionizable Salt of a Metal Occurring in Group VIII of the Periodic Table.** W. D. Stewart, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,451,182. **Composite Article Formed by Introducing into a Sheet of Vulcanized Rubber-Butyl Phthalyl Butyl Glycollate, Chlorinating the Surface of the Rubber, and Applying a Solution in Methyl Ethyl Ketone of Gamma Polyvinyl Chloride Plasticized with Butyl Phthalyl Butyl Glycollate, and Evaporating the Solvent.** G. H. Taft, Hudson, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,451,212. **Thermoplastic Coating Composition Including Norelac, a Mixture of Ortho and Para Toluene Ethyl Sulfonamides and Paraffin, All Dispersed in a Volatile Solvent.** L. J. Gold, Shorewood, Wis., assignor to Millprint, Inc., Milwaukee, Wis.

2,451,332. **Continuous Stripping of Polymer Latices.** A. D. Green, Cranford, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,451,333. **Synthesis of Polyhydroxy Compounds.** W. F. Gresham and R. E. Brooks, assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

2,451,370. **Long-Chain Secondary Alkyl N-Substituted Polymeric Styrene/Maleamic Acids and Dispersions Containing Them.** W. L. Alderson, Jr., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,451,410. **Laminating Syrup Including Silica Aerogel and a Thermosetting Resin.** E. M. Queeny, Kirkwood, assignor to Monsanto Chemical Co., St. Louis, both in Mo.

2,451,420. **Wet-Spinning Acrylonitrile Polymer Yarn.** W. W. Watkins, Waynesboro, Va., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,451,435. **Synthetic Resin Which Is a Copolymer of a Ketone and Acrylonitrile or Methacylonitrile.** W. E. Elwell and R. L. Meier, Berkeley, assignors to California Research Corp., San Francisco, both in Calif.

2,451,536. **Interpolymer of Diallyl Diglycolate and Styrene.** M. E. Cupery, Brandywine Hundred, and H. S. Rothrock, assignors to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, both in Del.

2,451,612. **Unsaturated Fluorohydrocarbons.** D. D. Coffman and L. F. Salisbury, assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

2,451,664. **Pentamethylphenyldisiloxane.** W. H. Daudt, assignor to Corning Glass Works, both of Corning, N. Y.

2,451,672. **Rendering N-Alkenoxymethyl Polyamides Insoluble in Alcohol and Increasing Their Melting Point.** H. W. Gray, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

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2,451,695. **Polyamides of High Birefringence.** R. S. Schreiber, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,451,712. **Simultaneously Producing Acrolein and Ethylene by Pyrolysis of Dihydropyran.** J. G. M. Bremner and D. G. Jones, both of Norton-on-Tees, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,451,743. **Embrittling Polythene by Admixture with Methylated Spirits, Then Mechanically Disintegrating the Resultant Mixture in an Enclosed Space and Drying.** K. B. Jarrett, Welwyn Garden City, England, assignor to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,451,787. **Emulsion Polymerization of Chloroprene, Which Includes Incorporating in the Emulsion prior to Polymerization an Ester of an Organic Acid of the Class of Keto Acids and Dicarboxylic Acids which Contain the Grouping**

$$-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-O-.$$

J. R. Vincent, Newport, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,451,792. **Waxfree Hot-Meltcoating Composition Consisting Essentially of an Ethyl Cellulose and a Ternary Mixture of a Refined Pale Mineral Oil, an Ester of Polymerized Rosin with a Polyhydric Alcohol, and a Maleic-Anhydride-Modified Ester Gum.** A. E. Young and K. D. Bacon, assignors to Dow Chemical Co., all of Midland, Mich.

2,451,865. **Adhesive Composition, Including as Principal Components (1) Zinc Oxide, (2) a Resinous Material, (3) Polyisobutylene or Copolymer of Isobutylene and a Diolefin or Mixtures thereof, and (4) a Light-Colored Factice.** W. J. O'Brien, West Haven, assignor to Seamless Rubber Co., New Haven, both in Conn.

2,451,867. **Melamine-Formaldehyde Resin Dispersion in a Non-Basic Water-Soluble Alcohol Medium.** G. Pitzl, Buffalo, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,451,935. **Method of Cast Polymerization.** N. C. Foster, McKeesport, assignor to Westinghouse Electric Corp., East Pittsburgh, both in Pa.

2,451,963. **Subjecting a Solution of a Hydrolyzed Interpolymer of Ethylene and Vinyl Acetate in Dioxane to a Temperature between 30 and 200° C. with Alkyl Isocyanate.** D. J. Loder, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,452,005. **Synthetic Resin Coating Composition Containing an Accelerator.** W. C. Weltman, Wilkinsburg, Pa., and T. F. Dixon, Pasadena, Calif., assignors to Westinghouse Electric Corp., East Pittsburgh, Pa.

2,452,012. **As a New Chemical Compound, a Composition from the Group of 3,3,5,5,3', 3', 5',5',—Octa (Beta-Cyanoethyl) —4,4'—Diketodicyclohexyl; bis [3,3,5,5 Tetra(Beta-Cyano-Ethyl)—4-Ketocyclohexyl] Methane; and 2,2 Bis—(3,3,5,5 Tetra(Beta-Cyanoethyl)—4—Ketocyclohexyl Propane.** P. J. Flory, Kent, assignor to Wingfoot Corp., Akron, both in O.

2,452,029. **Monomeric Addition Products of (a) One Molecular Equivalent of an Ester of Acrylic Acid and a Monohydric Alcohol and (b) One Molecular Equivalent of a Compound from the Class of Drying Oil Fatty Acids Having Conjugate Olefinic Bonds, and Esters Thereof.** H. A. Bruson, Rydal, and W. D. Niederhauser, assignors, by mesne assignments, to Rohm & Haas Co., both of Philadelphia, both in Pa.

2,452,092. **Rubber-Like Products from Polymers Prepared by Auto-Esterifying a Mixture of Pure Monohydroxystearic Acid and Pure Ricinoleic Acid.** W. C. Ault, Philadelphia, and B. B. Schaeffer, Upper Darby, both in Pa., assignors to the United States of America, as represented by the Secretary of Agriculture.

2,452,152. **Forming Polyvinyl Formal Coatings on Textiles.** J. H. Rooney, J. H. Sharphouse, and P. R. Hawtin, all of Spondon, England, assignors, by mesne assignments, to Celanese Corp. of America, a corporation of Del.

2,452,165. **A Resinous Heteropolymer of Isopropenyl Acetate and Maleic Anhydride.** C. C. Unruh and W. O. Kenyon, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,452,187. **Synthesis of Nitriles.** W. F. Gresham, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,452,190. **Polymerization of Ethylene by Contacting under Polymerizing Conditions with a Catalyst Consisting of Silica Gel, Alumina and a Metal from the Group of Nickel and Cobalt.** S. J. Hetzel, Cheltenham, and R. M. Kennedy, Drexel Hill, assignors to Sun Oil Co., Philadelphia, all in Pa.

2,452,198. **Polymerizing Olefins by Contacting with a Catalyst Consisting of Silica Gel, Alumina, and Nickel or Cobalt.** R. M. Kennedy, Drexel Hill, and S. J. Hetzel, Cheltenham, assignors to Sun Oil Co., Philadelphia, all in Pa.

2,452,209. **Cellulose Ether Plasticized with Bis(Allyl Lactate) Maleate.** C. E. Rehberg, Glenside, and C. H. Fisher, Abington, both in Pa., assignors to the United States of America, as represented by the Secretary of Agriculture.

2,452,254. **Liquid Polymeric Dimethyl Silicones.** R. R. McGregor, Verona, and E. L. Warrick, Pittsburgh, both in Pa., assignors to Corning Glass Works, Corning, N. Y.

2,452,374. **Producing Resinous Organic Condensation Reaction Products from a Mixture of Acrolein, and Anacardic Material and a Condensing Agent.** M. T. Harvey, South Orange, N. J., assignor to Harvel Corp., a corporation of N. J.

2,452,416. **Hydrolyzing a Liquid Dimethyl-Dihalogenosilane.** J. G. E. Wright, Alplaus, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,452,420. **Phenol-Aldehyde Molding Compositions.** J. Allan, Spondon, England, assignor, by mesne assignments, to Celanese Corp. of America, a corporation of Del.

2,452,460. **Recovery of 1-Cyanobutadiene-1,3 from a Mixture Containing Acetic Acid Impurity by Adding Triethylamine and Distilling.** V. L. Hansley, Niagara Falls, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,452,493. **Flux Coated Electrode Having as a Binding Agent in the Coating an Organo-Silicon Polymer.** E. C. Rollason, Waltham Abbey, and E. H. S. van Someren, Broxbourne, both in England, assignors to Metal & Thermit Corp., a corporation of N. Y.

Dominion of Canada

451,443. **Polymerizing at Atmospheric Pressure an Aqueous Suspension of Monomeric Methyl Methacrylate in a Reaction Vessel Provided with Means for Condensing and Returning to the Vessel Volatilized Material.** B. M. Marks, Upper Montclair, N. J., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,445. **Resinous Material Obtained by the Conjoint Polymerization of Vinyl Chloride with Fumaric Esters.** H. W. Arnold, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,446. **Production of an Interpolymer of Isobutylene and Vinyl Methacrylate by Subjecting a Mixture thereof to the Action of a Friedel-Crafts Catalyst at a Temperature below —10° C.** D. W. Huebner and J. E. Fearey, Norton-on-Tees, Durham, England, assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,447. **Rendering Polyvinyl Butyral Resins Insoluble by Mixing a Polyvinyl Butyral with a Butanol Modified Urea-Formaldehyde Resin and Heating.** E. A. Rodman, Newburgh, N. Y., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,448. **Products Having a Chain of Recurring Styrene Units and, Attached to the Terminal Units of the Chain, one H-Radical and One —CCl_3 Radical, Obtained by Contacting Styrene and Chloroform with Benzoyl Peroxide.** J. Harmon, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P. Q.

451,449. **For Producing Apparel with High Resistance to Penetration by Mustard Gas, a Coating Composition Containing a Cellulose Derivative and Polyhydric Alcohol-Polycarboxylic Acid Resin.** G. A. Griffiths, Wexham, Buckinghamshire, England, assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,452. **Vinyl Cyanide.** C. R. Harris, Lockport, and W. C. Sharples, Niagara Falls, both in N. Y., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,454. **Improved Interpolymer of 95% Vinyl Chloride and 5% Diethyl Fumarate Obtained by Heating the Interpolymer 30 to 60 Minutes at 130 to 150° C. with 0.25 to 10% Sulfur, 3% to 5% Zinc Oxide, and 0.25 to 5% Mercaptobenzothiazole.** B. W. Howk and H. J. Richter, both of Wilmington, Del., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P. Q.

451,455. **Polyvinyl Alcohol Insolubilized with Chlorinated Polymeric Ethers.** C. W. Mortenson, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,462. **Nitronitriles.** G. D. Buckley and R. L. Heath, both of Blackley, Manchester, England, assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,464. **Production of an Organic Nitrile by Passing a Gaseous Mixture of HCN and Ethylene Oxide over a Dehydration Catalyst.** C. R. Harris, Lockport, N. Y., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,475. **Liquid Solution of Polyethylene Suitable for the Hot-Dip Coating of Objects.** R. G. Woodbridge III, Niagara Falls, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., both in the U.S.A.

451,501. **Butadiene.** K. H. Hachmuth, assignor to Phillips Petroleum Co., both of Bartlesville, Okla., U.S.A.

451,567. **Molding Material Suitable for Injection Molding, Including Cellulose Acetate, a Trialkyl Carbinol, and a Diphenyl Ketone.** G. F. Metz, Diamond Point, N. Y., U.S.A.

451,599. **Mixing Hematoxylinoid Material with Polymerizable Unsaturated Organic Compounds from a Group of Styrene Compounds, Acrylates and Vinyl Esters, to Stabilize Them against Polymerization during Storage and Handling at Atmospheric and Somewhat Elevated Temperatures.** E. L. Cline, Pittsburgh, Pa., assignor to Allied Chemical & Dye Corp., New York, N. Y., both in the U.S.A.

451,621. **Butadiene.** W. M. Quattelbaum, Jr., Charleston, and W. J. Toussaint, South Charleston, both in W. Va., U.S.A., assignors to Carbide & Carbon Chemicals, Ltd., Toronto, Ont.

451,633. **Purification of Butadiene.** L. H. Horsley, Freeport, Tex., and H. S. Nutting, assignors to Dow Chemical Co., both of Midland, Mich., both in the U.S.A.

451,645. **Heat Stabilization of Vinylidene Chloride Resin by Means of a Polyglycol.** M. R. Radcliffe, Glen Rock, N. J., assignor to Firestone Tire & Rubber Co., Akron, O., U.S.A.

451,655. **Resinous Coating Composition, Including an Oilfree Polymerizable Phenol Formaldehyde Resin Dissolved in a Mixture of Steam Distilled Pine Oil, Ethyl Alcohol, and Butyl Alcohol.** C. H. Hempel and F. J. Ploederl, assignors to Heresite & Chemical Co., all of Manitowoc, Wis., U.S.A.

451,692. **Converting Butene to Butadiene.** W. R. F. Guyer, Elizabeth, assignor to Standard Oil Development Co., Linden, both in N. J., U.S.A.

451,707. **Inhibiting Cracking of Polymeric Bodies.** W. O. Baker, Morristown, N. J., assignor to Bell Telephone Laboratories, Inc., assignor to Western Electric Co., Inc., both of New York, N. Y., both in the U.S.A.

451,796. **Polymerized Ester of Carboxylic Acid.** H. J. Richter and H. S. Rothrock, both of Wilmington, Del., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,804. **Manufacture of Reinforced Rubber Articles, Such as Tires and the Like, Which Includes Applying to an Active-Hydrogen-Containing Fibrous Reinforcing Structure an Active-Hydrogen-Containing Rubber and a Cyanate, Associating the Resulting Structure with Vulcanizable Rubber, and Curing.** L. R. Herndon, Snyder, N. Y., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,807. **Fusible Polymers from a Preformed Dihydrazide of a Dicarboxylic Acid in Which the Carboxyl Groups Are Attached to Aliphatic Carbon Atoms.** W. W. Prichard, Wilmington, Del., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,810. **Making a Monomeric Ester of the Hypothetical Ethylidene Glycol and Acrylic or Methacrylic Acid by Introducing a Non-Polymerizing Catalyst, as Mercuric Sulfate or Boron Trifluoride, and Adding Acetylene in the Presence of the Catalyst and Pyrogallol Which Is Present as a Polymerization Inhibiter.** L. Coes, Jr., Brookfield, assignor to Norton Co., Worcester, both in Mass., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., both in the U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,813. **Plastic Synthetic Rubber Obtained by Polymerizing in Aqueous Dispersion and in the Presence of a Diazonium Salt, a Material Preponderantly a Compound of the Group of Polymerizable Acyclic 1,3-Diene Hydrocarbons and Their Monohalogen Derivatives.** H. W. Walker, Woodstown, N. J., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,814. **Polyvinyl Butyral-Resorcinol-Formaldehyde Adhesive.** A. Hershberger, Kenmore, N. Y., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,816. **Calendered Sheets from a Mixture Containing a Monohydric Alcohol-Modified Urea-Formaldehyde Resin and a Hydroxyl-Containing Polyvinyl Acetal.** R. M. Leekley, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,818. **Polymerizing a Mass the Polymerizable Portion of Which Consists Solely of Vinyl Acetate in the Presence of a Peroxy Catalyst and Lauryl Mercaptan.** M. J. Roedel, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,821. **Preparing Non-Thermoplastic and Insoluble Resins from Polyvinyl Acetal Resins.** G. T. Vaala, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,823. **Aqueous Dispersion of a Vinyl Acetate Polymer.** J. E. Smith and W. A. Drummond, both of Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,824. **Photopolymerization of a Mixture of Styrene and Carboxymethyl N,N-Dimethyl-Dithiocarbamate.** L. M. Richards, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,825. **Polymerization of Acrylic Acid Nitriles.** R. A. Jacobson, Landenberg, Pa., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,827. **Polymerizing Vinyl Fluoride.** D. D. Coffman and T. A. Ford, Wilmington, Del., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,828. **Sulfur-Containing Polyamides.** T. Le S. Cairns, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,830. **Improving the Processing Characteristics of Butadiene-Styrene Interpolymers by Incorporating a Polyvalent Metal Salt of a Terpene Mercaptan.** J. R. Vincent, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,831. **In a Laminated Product a Bonding Agent Which Is a N-Alkoxy-Methyl Polyamide.** F. W. Hoover, Wilmington, Del., U.S.A. assignor to Canadian Industries Ltd., Montreal, P.Q.

451,832. **Semi-Conducting Coating Composition for High-Tension Electric Cables, Including a Resinous Vehicle Containing a Non-Drying Oil Modified Alkyd Resin, a Polyvinyl Acetal Resin, a Urea-Formaldehyde Resin, and a Carbon Black.** D. E. Edgar, Westport, and D. J. Sullivan, Fairfield, both in Conn., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,833. **Orientable Polyvinylidene Fluoride Obtained by Heating Vinylidene Fluoride in the Presence of a Peroxy Compound as Polymerization Catalyst.** T. A. Ford, Wilmington, Del., and W. E. Handford, Easton, Pa., both in the U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,835. **Interpolymer of Methacrylyl Fluoride with Methyl Methacrylate.** B. W. Howk, Wilmington, Del., and R. A. Jacobson, Landenberg, Pa., both in the U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,836. **Interpolymer of Dimethyl 1-Propene-2-Phosphinate with Methyl Methacrylate.** R. V. Lindsey, Jr., Wilmington, Del., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,837. **Processing Elastomers by Masticating in the Presence of a Polyvalent Heavy Metal Salt of an N-Halogen.** H. E. Schroeder, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,838. **Nitrogen-Substituted Polyamides.** T. Le S. Cairns, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,839. **Obtaining N-Alkoxy-Methyl Polyamides.** W. H. Church, Buffalo, N. Y., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q.

451,840. **Resin Modified N-Alkoxymethyl Polyamides.** H. S. Rothrock, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P. Q.

451,846. **Interpolymer of 2-Nitro-2-Methyl-propyl Methacrylate and Methyl Methacrylate.** C. LeV. Agre, St. Paul, Minn., and R. M. Leekley, Springdale, Conn., both in the U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q.

451,854. **For Use in Anti-Friction Machine Elements and the Like, a Composition Including Macerated Cloth Impregnated with a Thermosetting Phenolformaldehyde Resin and Graphite and Powdered Heavy Metal Uniformly Dispersed Throughout the Resin.** E. J. Coleman, assignor to Crane Packing Co., both of Chicago, Ill., U.S.A.

451,857. **Manufacture of a Polymerizable Unsaturated Aliphatic Acid from Acrolein and Alpha-Substituted Derivatives thereof.** H. P. Staudinger, Ewell, K. H. W. Tuerck, Banstead, and E. H. Brittain, Epsom Downs, all in Surrey, England, assignors to Distillers Co., Ltd., Edinburgh, Scotland.

451,858. **Stabilized Rubber Hydrochloride Composition Containing the Reaction Product of an Aliphatic Aldehyde and an Ethylene Polyamine.** J. P. Chittum and G. E. Hulse, Jr., both of Passaic, N. J., U.S.A., assignors to Dominion Rubber Co., Ltd., Montreal, P.Q.

451,863. **Providing a Solid Methyl Methacrylate Polymer with Improved Surface Characteristics by Applying a Coating Including Hydrolyzed Ethyl Silicate and a Polyvinyl Butyral Resin.** M. F. Bechtold, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del., U.S.A.

451,872. **Polymerizing in Aqueous Emulsion a Mixture of Butadiene and a Copolymerizable Monomer, in the Presence of Water-Soluble Salts of Iron and Cobalt and a Water Soluble Pyrophosphate.** W. D. Stewart and B. M. G. Zwicker, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y., both in the U.S.A.

451,873. **Vulcanization of a Copolymer Butadiene-1,3 Hydrocarbon and an Alpha-Methylene Nitrile.** B. S. Garvey, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y., both in the U.S.A.

451,916-919. **Catalytic Polymerization of Unsaturated Esters.** D. E. Adelson and H. F. Gray, Jr., both of Berkeley, Calif., and R. P. Ruh, Columbus, O., assignors to Shell Development Co., San Francisco, Calif., both in the U.S.A.

451,984. **Liquid Vinyl Resin Dispersion Which Can Be Blended with Rubber Latex to Form Stable Emulsions Capable of Controlled and Uniform Coagulation.** G. P. Mack, Jackson Heights, L. I., assignor to Advance Solvents & Chemical Corp., New York, both in N. Y., U.S.A.

452,002. **Stable Resinous Emulsion.** P. H. Porter, Pittsburgh, Pa., U.S.A., assignor to Canadian Westinghouse Co., Ltd., Hamilton, Ont.

452,032. **In a Process for Producing Suède-Type Sheet Material, Coating a Woven Textile Fabric with a Mixture of Finely Divided Vinyl Polymer and a Plasticizer therefor.** J. Graham and H. A. Hirst, both of Manchester, England, assignors to Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

452,054. **Interpolymer of a Vinyl Aromatic Hydrocarbon and Fumarodinitrile.** D. T. Mowry, Dayton, O., assignor to Monsanto Chemical Co., St. Louis, Mo., both in the U.S.A.

452,063. **In Making Plastic Caoutchouc Materials, the Step of Adding, as Mollifying Agent, an Organic Polysulfide.** B. S. Groth, Stockholm, and K. O. Lillegren, Ornskoldsvik, assignors to Mo Och Domsjo A. B. Ornskoldsvik, all in Sweden.

452,085. **Reclaiming Vulcanized Conjugated Diolefin Polymer Compositions.** J. C. Elgin, Princeton, N. J., and E. F. Sverdrup, assignors to U. S. Rubber Reclaiming Co., Inc., both of Buffalo, N. Y., both in the U.S.A.

United States

606,096. **Methacrylamide.** Lonza Elektrizitatswerke u. Chemische Fabriken, A.G.

606,097. **Solutions of Polyvinyl Chlorides.** Soc. des Usines Chimiques Rhone-Poulenc.

606,099. **Plastic Compositions Containing Polymers or Copolymers of Vinyl Chloride.** Anglo-Iranian Oil Co., Ltd., E. W. M. Fawcett, and A. Millien.

606,116. **Polymerization of Vinyl Compounds.** S. A. des Manufactures des Glaces & Produits Chimiques de St.-Gobain, Chauny & Cirey.

606,150. **Copolymers and Process of Production.** H. G. C. Fairweather (Mathieson Alkali Works).

606,182 and 606,187. **Substituted Diamines.** Soc. des Usines Chimiques Rhone-Poulenc.

606,273. **Polymers and Copolymers Including Trifluoroethylene.** E. I. du Pont de Nemours & Co., Inc.

606,301. **Organo-Silicon Polymers.** C. Shaw, W. E. Smith, and H. G. Emblem.

606,364. **Polymerization of Vinylbiphenyl.** General Aniline & Film Corp.

606,400. **Halogenated Polymers.** Standard Telephones & Cables, Ltd.

606,416. **Product of Plastic Compositions.** Anglo-Iranian Oil Co., Ltd., E. W. M. Fawcett, and E. S. Narracott.

606,651. **Resins from Phenolic Mixtures.** Enterprises A. Cochery.

606,685. **Polymerizable Materials.** Imperial Chemical Industries, Ltd., R. Hammond, and J. W. C. Crawford.

606,701. **Preparation of Solid Pieces of Fusible Filament-Forming Polymers.** W. Pool.

606,702. **Stabilization of Organic Substances of High Molecular Weight Containing Combined Halogen.** N. V. de Bataafsche Petroleum Mij.

606,716. **Polymerizable Materials and Polymers thereof.** Imperial Chemical Industries, Ltd., and R. Hammond.

606,717. **Polymerizable Materials and Polymer thereof.** Imperial Chemical Industries, Ltd., R. Hammond and D. N. Speyer.

606,807. **Synthetic Elastomers.** Shell Development Co.

606,980. **Butadiene - Styrene Copolymer.** Wingfoot Corp.

607,031. **Resinous Condensation Products.** Beck, Koller & Co. (England), Ltd., E. A. Bevan, and R. S. Robinson.

607,044. **Chemical Compositions Containing Lead Dioxide.** Dunlop Rubber Co., Ltd., and M. Goldstaub.

607,103. **Organic Fluorine Compounds.** E. I. du Pont de Nemours & Co., Inc., and G. W. Rigby.

607,104. **Phenol Formaldehyde Condensation Resin.** Imperial Chemical Industries, Ltd., and T. J. B. Arthur.

607,111. **Accelerators for the Vulcanization of Natural and Synthetic Rubber.** Monsanto Chemical Co. and M. W. Harman.

607,233. **Production of Isoprene by the Distillation of Rubber.** Rubber Stichting.

607,234. **Preparation of Gel Particles.** C. Arnold (Standard Oil Development Co.).

607,253. **Preparation of Methyl Siloxanes.** Corning Glass Works.

607,268. **Synthetic Resinous Adhesives.** Wingfoot Corp.

607,300. **Aminoplast Molding Powder.** L. Smidth.

607,329. **Treatment of Polymeric Methyl Methacrylate.** Imperial Chemical Industries, Ltd.

607,426-427. **Organo-Silica Sols and Gels.** British Thomson-Houston Co., Ltd.

607,468. **Rubber-Base Uncooked Wrinkled Composition.** E. Lorenzo-Luaces.

607,469. **Cellulose-Base Wrinkle Composition.** N. T. Benyon.

607,499. **Vinyl Fluoride Polymers.** British Thomson-Houston Co., Ltd.

607,540. **Electrolytic Reduction of Poly-Hydroxy-Carboxylic Acid Lactones.** Roche Products, Ltd. (F. Hoffman-La Roche & Co., A.G.).

607,635. **Heat Hardenable Phenolic Resins.** Bakelite, Ltd.

607,704. **Emulsions of Polymerized Esters of Acrylic and Methacrylic Acids.** Vinyl Products, Ltd., J. E. O. Mayne, H. Reichard, and H. Warson.

607,720. **Biguanide Derivatives.** Imperial Chemical Industries, Ltd., A. D. Ainley, F. H. S. Curd, F. L. Rose.

607,734 **Polymerization Process.** E. I. du Pont de Nemours & Co., Inc.

607,735. **Polymerization of Monoethylene Compounds.** E. I. du Pont de Nemours & Co., Inc.

607,765. **Preparation of Amides from Acyclically Unsaturated Compounds.** Rohm & Haas Co.

607,773. **Resinous Compositions.** Cellomold, Ltd., and D. N. Davies.

607,811. **Preparation of Organo-Silicon Compounds.** Albright & Wilson, Ltd., and A. G. Taylor.

607,885. **Synthetic Resin Molding Compositions.** J. Allan.

607,888. **Polymerizable Organic Materials and Polymers thereof.** Imperial Chemical Industries, Ltd., and R. Hammond.

607,911. **Partially Hydrolyzed Vinyl Ester Polymers and Interpolymers.** E. I. du Pont de Nemours & Co., Inc.

607,913. **Resinous Bonding or Adhesive Compositions.** Westinghouse Electric International Co.

607,958. **Treatment of Latex and Like Aqueous Dispersions of Rubber.** J. F. Boiry.

608,023. **Synthetic Resinous Condensation Products.** Beck, Koller & Co. (England), Ltd., E. A. Bevan, and R. S. Robinson.

608,027. **Resinous Condensation Products.** Beck, Koller & Co. (England) Ltd., E. A. Bevan, and R. S. Robinson.

608,052. **Phenol-Formaldehyde Resins.** Westinghouse Electric International Co.

608,109. **Adhesives.** Imperial Chemical Industries, Ltd., E. J. G. Bailey, F. M. Page, and J. C. McGowan.

608,111. **Organic Fluorine Compounds.** Imperial Chemical Industries, Ltd., and W. B. Whalley.

608,202. **Polymerization of Vinyl Ethers.** General Aniline & Film Corp.

608,333. **Cured Ethylene Polymers.** E. I. du Pont de Nemours & Co., Inc.

608,414. **Curing Polymeric Materials.** E. I. du Pont de Nemours & Co., Inc.

608,487. **Preparation of Colloidal Aqueous Dispersions of Partially Polymerized Anionic Dimethylol Urea or Dimethylol Urea Ether and Methods of Treating Fibrous Materials with the Dispersions.** American Cyanamid Co.

608,492. **Amino-Alkyl Esters of Diphenylamine 2-Mono-Carboxylic Acids.** Ward, Blenkinsop & Co., Ltd., A. A. Goldberg, and H. S. Turner.

608,548. **Polymerization of Coumarone and Indene.** J. Wilkinson & Son, Ltd., and R. Y. Eagers.

608,635. **Polymerization of Vinyl Compounds.** A. Boake Roberts & Co., Ltd., and B. T. D. Sully.

608,665. **Hydrocarbon Copolymers.** J. C. Arnold (Standard Oil Development Co.).

608,698. **Highly Polymeric Carbamates.** Imperial Chemical Industries, Ltd., J. W. Batty, and H. P. W. Huggill.

608,758. **Organic Nitrogen Compounds.** Imperial Chemical Industries, Ltd., and C. W. Scaife, and H. Baldock (legal representative of H. Baldock, deceased).

608,806. **Chlorinated Trimethyl Acetonitrile.** E. I. du Pont de Nemours & Co., Inc.

608,807. **Copolymers of Halogenated Ethylenes.** E. I. du Pont de Nemours & Co., Inc.

608,835. **Polystyrene Composition.** Standard Telephones & Cables, Ltd.

608,921. **Polymerizing together a Plurality of Polymerizable Substances in the Emulsified State.** N. V. De Bataafsche Petroleum Mij.

608,922. **Manufacturing a Product Soluble in Water, from Natural Rubber, Gutta Percha,**

Balata, and Other Natural Rubber-Like Products. N. V. De Bataafsche Petroleum Mij.
608,940. **Resin Products.** Borden Co.
608,947. **Plasticized Compositions.** Firestone Tire & Rubber Co.
608,955. **Polymerization of Organo-Siloxanes.** Corning Glass Works.
608,956. **Organo-Silicon Compositions.** Corning Glass Works.
608,985. **Dimeric Condensation Products from Unsaturated Aldehydes.** Distillers Co., Ltd., R. H. Hall, and K. H. W. Tuerck.
609,012. **Hydrocarbon Copolymers.** C. Arnold (Standard Oil Development Co.).
609,099. **Production of Dispersions.** Semtex, Ltd., L. H. Griffiths, and W. Saul.
609,133. **Dielectric Compositions.** British Thomson-Houston Co., Ltd.
609,134. **Hydrogenation of Halogenosilanes.** British Thomson-Houston Co., Ltd.
609,138. **Synthetic Linear Polymers.** E. I. du Pont de Nemours & Co., Inc.
609,154. **Chlorinating Synthetic Rubbers.** Wingfoot Corp.
609,156. **Alpha, Beta-Dehaloacrylates and Polymers.** Wingfoot Corp.
609,173-174. **Preparation of Alkylhalogenosilanes.** British Thomson-Houston Co., Ltd.
609,177. **Polyethylene-Oxidation Inhibiter.** Bakelite Corp.
609,184. **Stabilization of Cyanhydrins.** E. I. du Pont de Nemours & Co., Inc.
609,225. **Preparation of Vinyl Halides.** B. F. Goodrich Co.
609,287. **Vulcanizable Compositions.** J. C. Arnold (Standard Oil Development Co.)
609,288. **Polymers and Copolymers of Chloroethylenes.** B. F. Goodrich Co.
609,291. **Polyvinyl Chloride Pastes.** Greenwich Leathercloth Co., Ltd., and R. G. Humphreys.
609,307. **Plastic Compositions.** Anglo-Iranian Oil Co., Ltd., E. W. M. Fawcett, E. S. Narracott, and A. Millien.
609,324. **Silicon Polymers from Organo-Substituted Silicanes.** Revertex, Ltd., and A. H. Campbell.
609,467. **Polymerization of 2-Vinyl Thiazoles.** United States Rubber Co.
609,482. **Manufacture of 2:5-Dichlorostyrene and Polymerization Products therefrom.** Monsanto Chemical Co.
609,507. **Alkyl Silicon Halides.** Dow Chemical Co.
609,533. **Maleic Anhydride from Maleic Acid.** J. G. Gaunt (J. M. Weiss).
609,586. **Solutions of Copolymers.** E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

PROCESS

United Kingdom

608,123. **Flexible, Collapsible Fluid Containers.** A. N. Spanel.
608,138. **Forming Plastic Material Impregnated Fabrics.** A. H. Stevens. (Swedlow Aeroplastics Corp.).
608,334. **Colored Artificial Fibers and the Like from Normally Solid Ethylene Polymers.** E. I. du Pont de Nemours & Co., Inc.
608,598. **Creaming Synthetic Rubber Latices.** United States Rubber Co.
608,717. **Resilient Bushes Including a Spring Embedded in Rubber, or the Like.** A. V. A., Ltd., and T. H. Pentony.
608,777. **Working of Rubber and the Like.** Redfern's Rubber Works, Ltd., and F. E. Brown.
608,875. **Coaxial Cables with Insulating Wedges.** Compagnie Generale d'Electricite.
608,893. **Pasting Halogen-Containing Polymerization Products on Surfaces.** N. V. de Bataafsche Petroleum Mij.
609,016. **Pneumatic Tire Covers.** Dunlop Rubber Co., Ltd., and L. S. Blanchard.
609,086. **Vulcanization of Natural or Synthetic Rubber.** B. F. Goodrich Co.
609,158. **Insulated Wire and Cables for Electrical Purposes.** British Insulated Callender's Cables, Ltd., D. C. Hancock, and H. R. Lorch.
609,310. **Dielectric Heating of Plastic Compositions.** Standard Telephones & Cables, Ltd.
609,469. **Shoes.** United States Rubber Co.
609,560. **Comminuting of Polythene.** F. W. Berk & Co., Ltd., E. Mehl, and L. H. Bellamy.

United States

2,450,948. **Elastic Fabric.** B. H. Foster, Maplewood, N. J., assignor to United States Rubber Co., New York, N. Y.
2,451,016. **Elastic Threads.** S. W. Alderfer, Akron, O.
2,451,597. **Annealing Calendered Thermoplastic Material.** W. R. Wheeler, Plainfield, N. J., assignor to Bakelite Corp., a corporation of N. J.
2,451,973. **Building a Pneumatic Tire.** J. F. Purdy, Cuyahoga Falls, assignor to Wingfoot Corp., Akron, both in O.
2,451,986. **Fabricating Extruded Thermoplastic Articles.** C. E. Slaughter, New Canaan, assignor to Extruded Plastics, Inc., Norwalk, both in Conn.
2,452,080. **Continuously Extruding Vinylidene Chloride Polymer Tubes and Stretching Them.** W. T. Stephenson, assignor to Dow Chemical Co., both of Midland, Mich.
2,452,284. **Injection of Brake Linings.** C. H. Beare, Dayton, O., assignor to General Motors Corp., Detroit, Mich.
2,452,347. **Gas Expanded Rubber.** R. C. Bascom, Port Clinton, O., assignor to Rubatex Products, Inc., New York, N. Y.
2,452,431. **Vulcanizable Elastic Coil Cables Having Reversingly Coiled Portions.** R. D. Collins, Beverly Hills, Calif., and W. J. Drigot, Chicago, Ill., Drigot assignor to Kellogg Switchboard & Supply Co., a corporation of Ill.
2,452,432. **Elastic Coil Structures with Uncoiled Ends.** R. D. Collins, Beverly Hills, Calif., assignor of one-half to Kellogg Switchboard & Supply Co., a corporation of Ill.
2,452,433. **Elastic Coil Cables with Longitudinal Ends.** R. D. Collins, Beverly Hills, Calif., assignor of one-half to Kellogg Switchboard & Supply Co., a corporation of Ill.

Dominion of Canada

451,435. **Feeding Belting into a Trough-like Channel Framed in a Rotating Vulcanizing Drum.** G. D. Marey, Newton Highlands, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass., U.S.A.
451,725. **Casting and Trimming Plastic Castings.** L. H. Morin, assignor of one-half to D. Marinsky, both of New York, N. Y., U.S.A.
451,864. **Preparing a Cellular Plastic Product.** R. E. Maier, Upper Montclair, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., both in the U.S.A.
451,950. **Laminated Structure.** P. Crosley, III, Coral Gables, Fla., U.S.A.
452,030. **Composite Materials of Wire and Textile Fabric.** J. Graham and H. A. Hirst, Tire & Rubber Goods Co., Ltd., Toronto, Ont.

MACHINERY

United States

2,450,324. **Apparatus for Coiling Thermoplastic Material.** O. C. Wilson, Lakewood, and P. S. Britton, Bratenahl, both in O.
2,450,457. **Apparatus to Coagulate an Unfrothed Coagulable Fluid.** T. A. Te Grotenhuis, Olmsted Falls, assignor to General Tire & Rubber Co., Akron, both in O.
2,450,575. **Means for Working Rubber.** S. Bolling, Cleveland, O.
2,450,847. **Apparatus for Treating Weftless Cord Fabric Preparatory to Its Incorporation in a Body of Rubbery Material.** W. W. Wilson, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
2,451,027. **Plastic Material Cutter.** J. J. Gano, Worcester, and L. W. Richardson, Cherry Valley, both in Mass., assignors to Controls Laboratories, Inc., a corporation of Del.
2,451,097. **Tire Bead Spreader for Use in Assembling Tire Casings with Interior and Exterior Retread Vulcanizing Mold Elements.** H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.
2,451,961. **Dipping Apparatus to Make Hollow Articles.** L. Landau, assignor to Latex Industries Ltd., both of Chingford, England.
2,451,992. **Device to Cure Pneumatic Tires.** T. A. Te Grotenhuis, Olmsted Falls, assignor to General Tire & Rubber Co., Akron, O.
2,452,382. **Apparatus for Molding Rubber and Plastic Materials.** E. S. Long, Los Angeles, Calif.
2,452,433. **Apparatus to Make Elastic Coil Structures with Longitudinal Ends.** R. D. Collins, Beverly Hills, Calif., assignor of one-half to Kellogg Switchboard & Supply Co., a corporation of Ill.
2,452,434. **Apparatus for Making Plastic Coil Structures with Longitudinal Ends.** W. J. Crehan, Chicago, and R. J. Arnold, Western Springs, assignors, by mesne assignments, to Kellogg Switchboard & Supply Co., Chicago, both in Ill., and R. D. Collins, Beverly Hills, Calif.
2,452,435. **Apparatus for Producing Elastic Coils with Connecting Tails.** R. J. Arnold, Western Springs, Ill., and W. D. MacDonald, Santa Monica, and R. D. Collins, Beverly Hills, both in Calif., assignors, by mesne assignments, of one-half to Kellogg Switchboard & Supply Co., Chicago, Ill., and one-half to R. D. Collins, Beverly Hills, Calif.

Dominion of Canada

451,435. **Machine for Shaping and Vulcanizing Belting.** G. D. Marey, Newton Highlands, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass., U.S.A.
451,436. **Thermoplastic Materials Extruder.** D. N. Davies, assignor to Cellomold Ltd., both of Feltham, Middlesex, and in liquidation, by H. N. Butler and R. D. Brewis, liquidators, assignor to British Resin Products, Ltd., all of London, both in England.
451,469. **Apparatus for Milling and Conveying a Plastic.** W. R. Marshall, Bloomfield, N. J., U.S.A., assignor to Carbide & Carbon Chemicals, Ltd., Toronto, Ont.
451,543. **Device to Construct Insulated Conductors.** C. W. Abbott, Larchmont, N. Y., U.S.A.
451,678. **Apparatus for Coating an Elongated Body with a Uniform Layer of Plastic Material.** F. R. Seavey, Alton, assignor to Olin Industries, Inc., East Alton, Ill., U.S.A.
451,864. **Apparatus for Forming a Cellular Plastic Product of Uniform Cross-Section and Shape.** R. E. Maier, Upper Montclair, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., both in the U.S.A.
451,922. **Apparatus for Making Sponge Rubber Cake and Like Articles.** J. A. MacKay, Barberton, and C. H. Nagel, Akron, assignors to Sun Rubber Co., Barberton, both in O., U.S.A.
452,042. **Extruder.** F. T. Griffiths, Gravesend, Kent, assignor to W. T. Henley's Telegraph Works Co., Ltd., Dorking, Surrey, both in England.

United Kingdom

605,867. **Injection Molding Apparatus.** A. H. Stevens (Chrysler Corp.).
606,167. **Apparatus for Processing Plastic Material.** Firestone Tire & Rubber Co.
606,174. **Apparatus for Pressing or Consolidating Plastic Materials.** G. Antonietti.
606,325. **Heating Elements for Vulcanizing and Like Elements.** W. E. Langrish-Smith and W. Frost.
606,331. **Injection Molding Device.** British Resin Products, Ltd., and D. N. Davies.
606,337. **Vulcanizing Presses.** McNeil Machine & Engineering Co.
606,411. **Apparatus to Build Tire Covers.** Dunlop Rubber Co., Ltd., and T. Norcross.
606,879. **Plasticizing Apparatus for the Molding of Plastics.** Communications Patents, Ltd., and F. Youle.
607,368. **Apparatus for Feeding Powdered Materials to Spraying Pistols.** Schori Metallizing Process, Ltd., and C. F. Lumb.
607,369. **Apparatus for Feeding Powdered Materials to Spraying Pistols.** Schori Metallizing Process, Ltd., and W. D. Jones.
607,430. **Portable Appliances for Vulcanizing Tires, Etc.** H. C. Penton.
607,816. **Device to Perforate Elastic Sheet Material.** H. Ewing.
607,904. **Machinery to Cut Out Pieces of Plastic Material from a Continuously Moving Sheet.** T. & T. Vicars, Ltd., and E. M. Crosland.
608,521. **Device to Apply Adhesive to Workpieces.** H. W. Pochin, R. P. Swain, and L. H. Dove.
608,597. **Tire Building Machine.** General Tire & Rubber Co.
608,727. **Batteries of Rollers for the Preparation of Crepe Rubber.** A. A. Waddell and J. Cairns.
608,848. **Cutting and Embossing Machinery for Plastic Sheet Material.** T. & T. Vicars, Ltd., and J. F. Naylor.
609,067. **Coiling Machine for Extruded Rubber Tubing, Etc.** G. S. Moulton & Co., Ltd., F. Shaw & Co., Ltd., H. Helps, and J. M. Chystal.
609,319. **Tire Molds.** Auto Tire Services, Ltd.
609,320. **Apparatus for Use in the Manufacture of and When Retreading Tires.** Auto Tire Services, Ltd., and J. H. F. Kent.

UNCLASSIFIED

United States

2,450,042. **Antiskid Chain.** E. P. Harold, Menasha, Wis.

Calco
REG. U. S. PAT. OFF.

RETARDER PD*

RETARDER PD is a non-toxic, fine white powder with a specific gravity of approximately 1.50.

RETARDER PD gives good retarding or anti-scorch effects at processing temperatures and very little or no retarding effect at curing temperatures. It is practically *non-discoloring* so that it may be used in white and light colored stocks.

RETARDER PD is very effective with the thiazole type of accelerators or with combinations of the thiazole accelerators and guanidine accelerators or thiuram disulfides.

RETARDER PD has no effect on the physical properties or aging qualities of the vulcanized stocks.

RETARDER PD is not recommended for use in stocks containing high amounts of currently available reinforcing furnace blacks.

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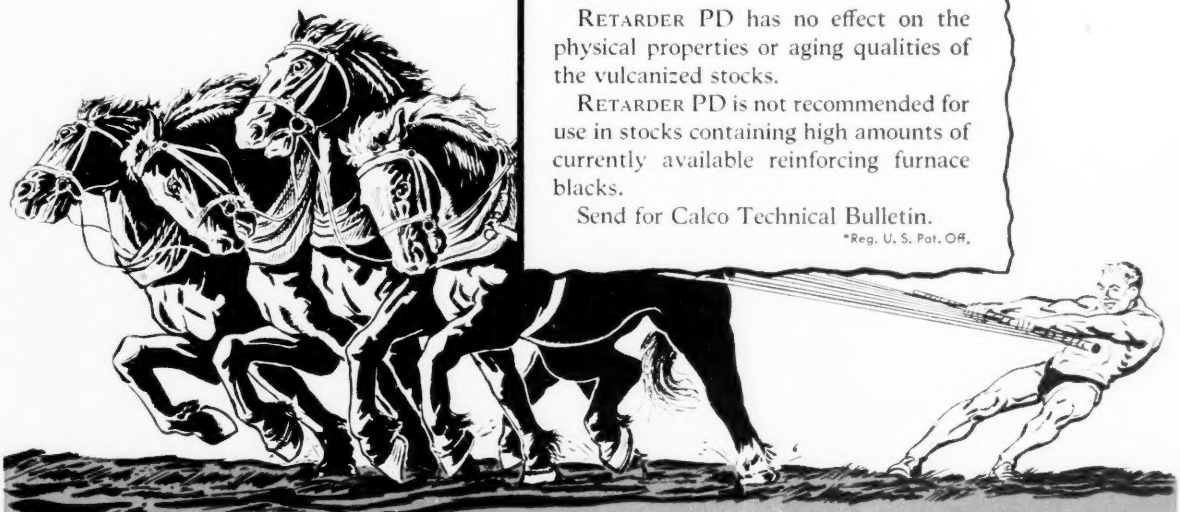
*Reg. U. S. Pat. Off.



Calco

RUBBER CHEMICALS DEPARTMENT

CALCO CHEMICAL DIVISION

AMERICAN CYANAMID COMPANY

BOUND BROOK • NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • Ernest Jacoby & Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto.

2,450,487. **Tire Chain.** E. Schaber, Cold Spring, Ky.

2,450,672. **Resilient Wheel.** J. M. MacLean, Vancouver, B. C., Canada.

2,450,691. **Nonskid Device.** C. E. Russell, Massillon, O.

2,450,727. **Resiliently Mounting a Roll on a Shaft.** F. L. Haushalter, Pontiac, Mich.

2,450,760. **Safety Device for Rubber Mills.** J. E. Lodge, Baltimore, Md., assignor to Western Electric Co., Inc., New York, N. Y.

2,450,776. **Traction Shoe Attachment for Wheels.** C. J. Aschenbach, Manitowoc, Wis.

2,450,880. **Brittle Point Tester.** C. K. Chatten and S. A. Eller, both of New York, N. Y.

2,451,166. **Tire Pressure Alarm Switch.** H. L. Hull, Anderson, Ind.

2,451,269. **Flexible Tubing Joint.** F. M. Allen, Azusa, and R. E. Snyder, Pasadena, assignors to All-Flex Corp., Los Angeles, all in Calif.

2,451,368. **Hose Handling Apparatus.** LeR. J. and J. White, both of Wilmington, Del.

2,451,761. **Antiskid Cross Chain.** W. A. Miller, Buffalo, and R. E. Gerspacher, Kenmore, assignors to Columbus McKinnon Chain Corp., Tonawanda, all in N. Y.

2,451,794. **Machine for Folding Sheets of Thermoplastic and Like Material.** M. M. and H. M. Balsam, assignors to M. M. Balsam, Inc., all of New York, N. Y.

2,451,919. **All-Textile Stretchable Yarn.** R. J. Clarkson, Winnsboro, S. C., assignor to United States Rubber Co., New York, N. Y.

2,452,110. **Auxiliary Safety Wheels for Use on Automobiles and Trucks.** G. J. Dourte, Denver, Colo.

2,452,245. **Hose Clamp.** A. A. Kollman, Los Angeles, Calif.

2,452,296. **Tire Deflation Indicator.** W. V. Eslinger and W. N. Barton, both of Arlington, Va., M. V. Eslinger assignor to G. B. Eslinger, Falls Church, Va.

2,452,494. **Pull Point Connection Device for Large-Size Electric Insulated Cables.** E. M. Rothen, Bloomfield, N. J., assignor to Russell & Stoll Co., Inc., New York, N. Y.

Dominion of Canada

451,417. **Nonskid Traction Device.** H. A. Mitchell, Wooler, Ont.

451,488. **Fatigue Machine for Testing Materials Submitted to Repeated Tensile Stresses.** R. L'Hermite, assignor to Groupement Français pour le Developpement des Renherches Aeronautiques, both of Paris, France.

451,600. **Form for Use in the Manufacture of Self-Sealing Tank Cells, Consisting of a Hollow Body of Felted Fibers.** R. D. Heymann, New Hartford, assignor to William L. Gilbert Clock Corp., Winsted, both in Conn., assignor to Animal Trap Co. of America, Lititz, Pa., both in the U.S.A.

451,898. **Improved Viscosimeter of the Spinning Cup Type.** S. A. Loukomsky, Bound Brook, N. J., and C. R. Stock, Greenwich, Conn., assignors to American Cyanamid Co., New York, N. Y., all in the U.S.A.

452,025. **Packaging Dressed Carcasses in an Impervious, Flexible, and Stretchable Bag.** G. E. Gott and B. A. Fairbank, both of Cambridge, E. E. Habib, Arlington, and F. B. Casey, Belmont, all in Mass., U.S.A., assignors to Dewey & Almy Chemical Co. of Canada, Ltd., Ville La Salle, P.Q.

452,063. **Hose Coupling.** A. C. Hoffman, Milldale, assignor to Scovill Mfg. Co., Waterbury, both in Conn., U.S.A.

United Kingdom

605,985. **Clamping Appliance for Use in Vulcanizing Repair Patches on Rubber.** R. K. Morgan.

606,323. **Hose Couplings.** Weatherhead Co.

606,392. **Flexible Couplings.** J. Hendy Iron Works.

606,810 and 606,873. **Flexible Hose Couplings.** Bowden (Engineers), Ltd., and W. A. Melsom.

607,075. **Insulation Stripper.** O. P. T. Kantorowicz.

607,161. **Tire Inflater.** Clayton Dewandre Co., Ltd., and S. E. Willett.

607,336. **Flexible Conduit Joints.** British Thomson-Houston Co., Ltd.

607,340. **Couplings for Fluid Supply Systems.** Telecalemit, Ltd., and C. C. S. Le Clair.

607,470. **Hose End Fittings.** E. C. Carling.

607,529. **Erection of Overhead Electric Cables.** Pirelli-General Cable Works, Ltd., and J. R. Harding.

607,805. **Detachable Wheels for Road Vehicles.** Dunlop Rubber Co., Ltd., and P. B. Chatterton.

607,925. **Bench for Taking Pneumatic Tire Covers off Vehicle Wheels.** R. Antraigue.

607,940. **Power Transmission Coupling.** T. Hindmarch.

608,292. **Treatment of Cotton Fibers.** United States Rubber Co.

608,359. **Brake Actuating Means for the Landing Wheels of Aircraft.** Dunlop Rubber Co., Ltd., and H. Trevaskis.

608,624. **Joints in Thermoplastic Materials.** Standard Telephones & Cables Ltd., (trading as Stanelco Products) and H. S. Bishop.

608,672. **Inflating Devices for Lifeboats, Rafts, Etc.** W. W. Triggs (Specialties Development Corp.).

609,466. **Method of Electrolytically Removing a Dried Deposit of a Rubber-Containing Fluid from Ferrous Metal Containers.** United States Rubber Co.

609,598. **Apparatus for Free Blowing Thermoplastic Sheet Material.** Goodyear Aircraft Corp.

TRADE MARKS

United States

440,754-755. **Monomel.** Synthetic resins. Monsanto Chemical Co., St. Louis, Mo.

440,779. **Pioneer.** Mechanical rubber goods. Pioneer Rubber Mills, San Francisco, Calif.

440,782. **Typhoon.** Bicycle tires. Arnold, Schwinn & Co., Chicago, Ill.

440,784. **Koroseal.** Sheeting. B. F. Goodrich Co., New York, N. Y.

440,802. **Advaresin.** Synthetic resins. Advance Solvents & Chemical Corp., New York, N. Y.

440,803. **Heribex.** Plastic sheeting. Heribert, Inc., New York, N. Y.

440,809. **Lustrex.** Synthetic resins. Monsanto Chemical Co., St. Louis, Mo.

440,852. **Skyt.** Game. W. J. Van Deest, May Lake, High Sierra Camp, Yosemite National Park, Calif.

440,912. **Keko.** Plastic bags. Kennedy Car Liner & Bag Co., Inc., Shelbyville, Ind.

440,958. Representation of a gold cup and the words: **"Gold Cup."** Tire coating and paint. Dunlop Tire & Rubber Corp., Buffalo, N. Y.

441,029. **Dainty Step.** Footwear. Holmes, Stickney & Walker, Inc., Portland, Me.

441,068. **Itarco.** Tires and repair outfits. India Tyre & Rubber Co., Ltd., Inchinnan, Scotland.

441,071. Representation of a gold cup and the words: **"Gold Cup."** Rubber solvent. Dunlop Tire & Rubber Corp., Buffalo, N. Y.

441,116. **Ranger For Men of Action Heavy Duty Shoes.** Footwear. Endicott Johnson Corp., Endicott, N. Y.

441,145. **Velon.** Vinyl-type plastic yarns. Firestone Tire & Rubber Co., Akron, O.

441,148. Representation of an oblong containing the word: **"Anodex."** Latex. American Anode Inc., Wilmington, Del.

441,162. **DC.** Organosilicon polymers. Dow Corning Corp., Midland, Mich.

441,167. **Koroseal.** Resinous plastic molding. B. F. Goodrich Co., Akron, O.

441,172. **Plastitool.** Liquid phenolic casting resin. Calresin Corp., Culver City, Calif.

441,178. **Griptex.** Adhesive cements. Adhesive Products Corp., New York, N. Y.

501,670. **Fabrilite.** Plastic-coated fabrics and plastic film. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

501,671. **Thermonized.** Fan belts. Thermoid Co., Trenton, N. J.

501,672. Representation of a triangle containing the words: **"Dri-Wear."** Compositions for treating fabrics to render these water repellent. Dri-Weat, Inc., New York, N.Y.

501,696. **Ajax.** Combs. Vulcanized Rubber & Plastics Co., New York, N. Y.

501,697. **Vulco.** Combs. Vulcanized Rubber & Plastics Co., New York, N. Y.

501,698. Representation of a warrior. Combs. Vulcanized Rubber & Plastics Co., New York, N. Y.

501,712. **Leathercote.** Artificial leather. American Finishing Co., Memphis, Tenn.

501,718. **Timing.** Transmission belts. United States Rubber Co., New York, N. Y.

501,719. **Super-Cord.** Belts, belting, and hose. Goodyear Tire & Rubber Co., Akron, O.

501,720. **Tu-Tone.** Rugs and matting. Goodyear Tire & Rubber Co., Akron, O.

501,738. **Best Ever.** Combs. Vulcanized Rubber & Plastics Co., New York, N. Y.

501,748. **FFM.** Garter belts, garters, etc. Fashion Form Mfg. Corp., White Plains, N. Y.

501,777. **Tire-King.** Tire inflating devices. Kidde Mfg. Co., Inc., Bloomfield, N. J.

501,783. **Double Indemnity.** Raincoats. Kaplowitz Bros., Inc., Washington, D. C.

501,802. **Expanso.** Suspenders and garters. Knothe Bros. Co., Inc., New York, N. Y.

501,811. **Gossard.** Corsets, garter belts, etc. H. W. Gossard Co., Chicago, Ill.

501,913. Representation of an oval containing the words: **"Ever Fast."** Liquid cement. J. Goldner, doing business as Warwick Laboratories Co., Brooklyn, N. Y.

501,924. **Warco.** Cement compound. J. Goldner, doing business as Warwick Laboratories Co., Brooklyn, N. Y.

501,933. **K68.** Asbestos sheet material for packing purposes. Raybestos-Manhattan, Inc., Passaic, N. J.

501,934. **Pyroid.** Asbestos sheet material for packing purposes. Raybestos-Manhattan, Inc., Passaic, N. J.

501,935. **Grey-Rock Balanced Truckset.** Brake linings. Raybestos-Manhattan, Inc., Passaic, N. J.

501,939. **Bracer.** Combination girdle and athletic supporter for men. Kendall Co., Boston, Mass.

501,988. **"Whiskers."** Balls. Eagle Rubber Co., Inc., Ashland, O.

501,989. **Featherweight.** Garters, braces, and suspenders. Pioneer Suspender Co., Philadelphia, Pa.

502,047. Representation of a double circle containing the word: **"Laher."** Brake linings and tires. Laher Spring & Tire Corp., Oakland, Calif.

ES

502,051. **ES** Thermoplastic rubber-resin sheet material. United States Rubber Co., New York, N. Y.

502,073. Representation of a diamond containing the word: **"Lenz."** Wires, cables, and cords. Lenz Electric Mfg. Co., Chicago, Ill.

502,081. **Corinne, Jr.** Raincoats. Stix, Baer & Fuller Co., St. Louis, Mo.

502,084. **The Westbrook.** Suspenders. Knothe Bros. Co., Inc., New York, N. Y.

502,095. **Tuffcote.** Conveyer belting. Thermoid Co., Trenton, N. J.

502,103. Representation of a circle containing the letters: **"KS."** Tires tubes, and repair materials. Kelly-Springfield Tire Co., Cumberland, Md.

502,107. **"Gilt Edge."** Packing material. Raybestos-Manhattan, Inc., Passaic, N. J.

502,108. **"Chicora."** Packing material. Raybestos-Manhattan, Inc., Passaic, N. J.

502,109. **Condor.** Brake linings, clutch facings, belting, hose, and machinery packing. Raybestos-Manhattan, Inc., Passaic, N. J.

502,110. **Ray-Man.** Belting, hose, and packing material. Raybestos-Manhattan, Inc., Passaic, N. J.

502,111. **Lee of Conshohocken.** Tires, inner tubes, repair kits, tire patches, tire flaps, hose, gaskets, and tubing. Lee Rubber & Tire Corp., Conshohocken, Pa.

502,112. **Lee.** Tire, inner tubes, valve patches, tubing, hose, and belting. Lee Rubber & Tire Corp., Conshohocken, Pa.

502,119. **Foodtex.** Belting. Victor Balata & Textile Belting Co., New York, N. Y.

502,120. **Easton.** Belt. Victor Balata & Textile Belting Co., New York, N. Y.

502,136. **Bestolite.** Sheet packing and gaskets. Stewart R. Browne Mfg. Co., Inc., New York, N. Y.

502,146. **Mayfair.** Tires. Mayfair Tire Co., Chicago, Ill.

502,173. **Vee-Lok.** Clutch facings. Raybestos-Manhattan, Inc., Passaic, N. J.

502,225. **Arco.** Heels and soles. Auburn Rubber Corp., Auburn, Ind.

502,230. **Crepex.** Rubber and synthetic rubber. Danbury Rubber Co., Inc., Danbury, Conn.

502,290. Representation of a label containing the words: **"Feather Bed Air Conditioned Shoes Like Walking On Air."** Footwear. E. J. Givren Shoe Co., Inc., Rockland, Mass.

502,294. Representation of a circle outside of which are the words: **"Taylor Engineering Co., Inc."** and containing the letters: **"ETC."** Fire extinguisher and tire inflator. Taylor Engineering Co., Inc., Elgin, Ill.

502,306. **Empire.** Crib sheets and table covers. Empire Shield Co., Inc., New York.

502,314. **VAC.** Footwear. Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

502,317. **Grey-Rock.** Belts and hose. Raybestos-Manhattan, Inc., Passaic, N. J.

502,320. Representation of a diamond containing the word: **"Goodyear."** Erasers. Rosenthal Co., New York, N. Y.

502,322. **Okometal.** Sheaths for cables. Okonite-Callender Cable Co., Inc., Paterson, N. J.

502,323. **GilAsh.** Footwear. Geo. Gillis Shoe Corp., Fitchburg, Mass.

502,343. **School Boy's Pride.** Footwear. Powell & Campbell, Inc., New York, N. Y.

502,344. **He Boy.** Footwear. Powell & Campbell, Inc., New York, N. Y.

502,355. **DTT.** Tires and inner tubes. Kelly-Springfield Tire Co., Cumberland, Md.

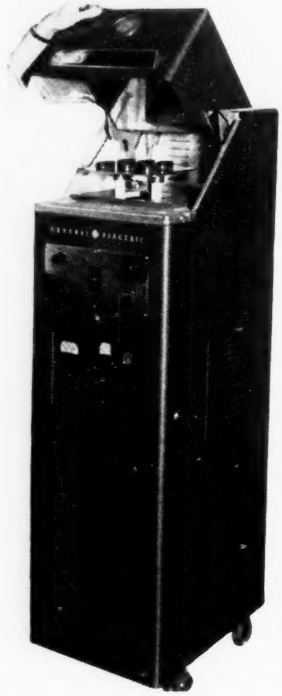
502,356. **Kelly Springfield.** Tires, tubes, repair patches, and camelback. Kelly-Springfield Tire Co., Cumberland, Md.

502,376. **Acmebak.** Gutta percha coated fabric. Acme Backing Corp., Brooklyn, N. Y.

502,422. **The 12-Monther by Rainbar Togs.** Raincoats and rubbers. Rainbar Togs, Inc., New York, N. Y.

New Machines and Appliances

Dielectric Preheater



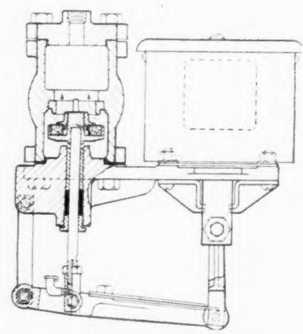
New G-E Preheater for Plastic Preforms

A NEW 3-kw. 40-megacycle preheater for rapid and uniform preheating of plastic preforms has been announced by the industrial heating division of General Electric Co., Schenectady 5, N. Y. Operating on 230 volts, single-phase, 60 cycles, the new preheater will heat 40 ounces of woodflour-filled phenolic compound from 70 to 250° F. in one minute, or one pound of this material in 24 seconds. Readily portable and sturdily built for heavy-duty industrial use, the machine is provided with an automatic "pop-up" cover which facilitates preform loading and unloading. In addition two timers with associated control permit operation alternately with two presses having different load requirements.

Another feature of the preheater is the incorporation of three meters, with dials mounted on the front of the cabinet. One meter indicates the direct current applied to the oscillator circuit, which is an indication of the rate of heat input to the preforms; the second shows safe operation of the oscillator tube; and the third indicates either oscillator or rectifier filament voltage. Separate rheostats in the filament circuit permit proper voltage setting, thus assuring long tube life.

Protective features include control circuit fuses, safety interlocks on the cover and control circuit door, and overload relay for protecting tubes and associated parts. Besides a single, specially designed vane-axial blower with safety interlocks amply cools the equipment with filtered air while in operation. The preheater is 15 1/16 inches wide, 20 11/16 inches deep, 54 7/32 inches high, and weighs approximately 450 pounds.

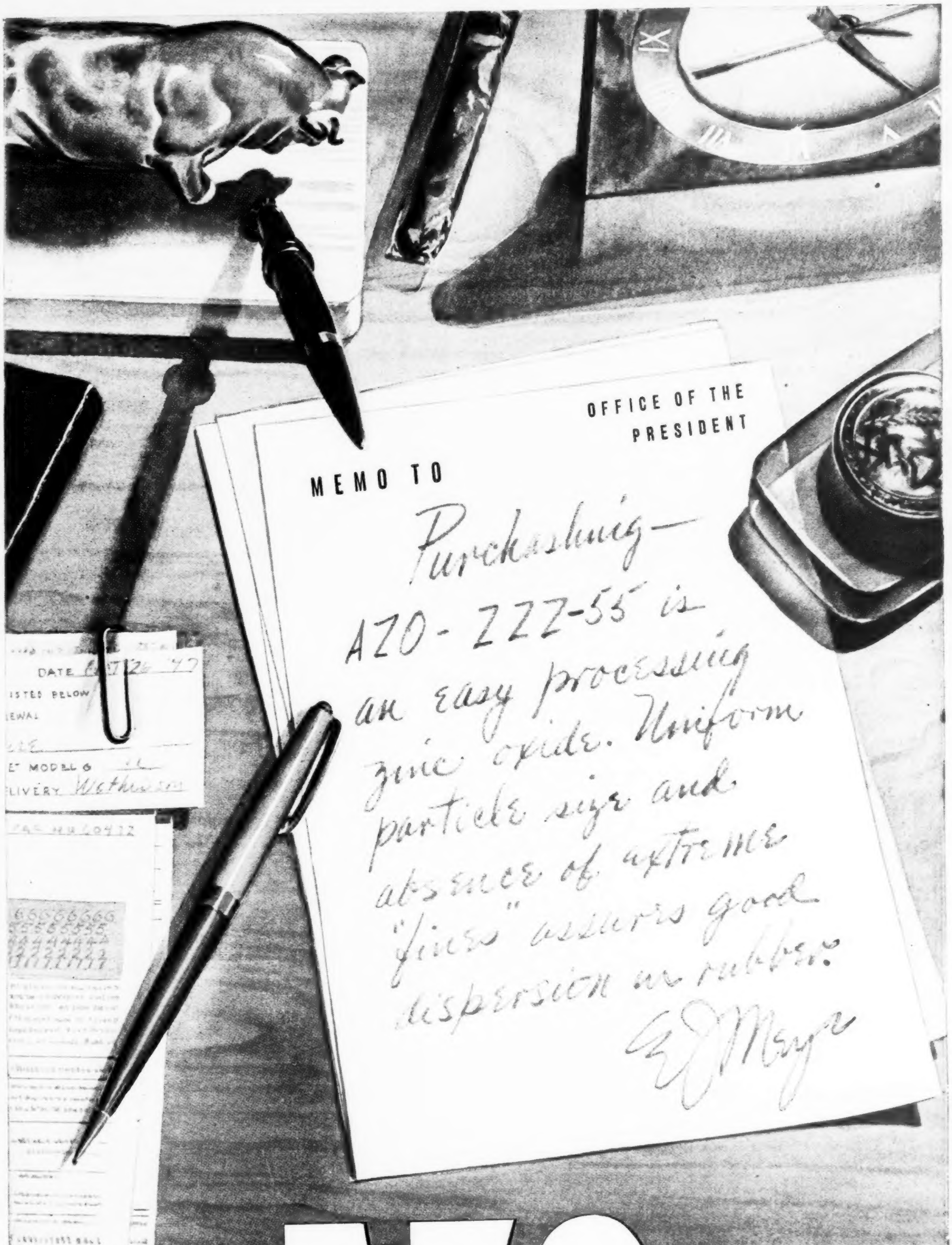
Emergency Valve



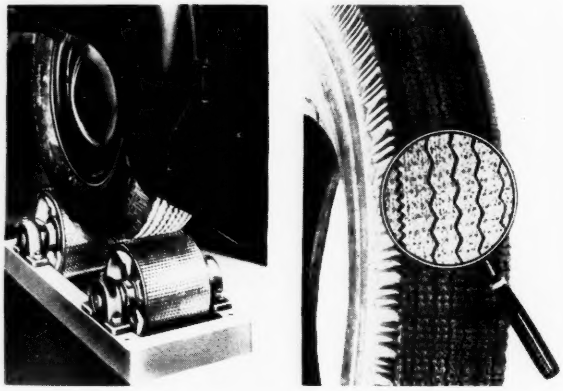
Drawing of New Johnson Solenoid Valve for Emergency Service

A 150-POUND globe type-solenoid valve, specifically designed to meet emergency or safety requirements, has been announced by Johnson Corp., 869 Wood St., Three Rivers, Mich. Intended for service in which the valve is normally open, this new Series No. 6000 valve is capable of remaining closed for indefinite periods of time. When an emergency arises, the control element immediately causes the solenoid to be energized, thus closing the valve instantly. Since the valve closes with pressure and flow, it will remain closed as long as a pressure above three pounds exists on the inlet side and regardless of whether or not the solenoid continues to be energized.

A simple piping arrangement is utilized to permit easy opening


OFFICE OF THE PRESIDENT
MEMO TO
Purchasing—
AZO-ZZZ-55 is
an easy processing
zinc oxide. Uniform
particle size and
absence of extreme
"fines" assures good
dispersion in rubber.
E J Meyer

of the valve once the emergency has passed. A 1/8-inch pipe, branching from the main inlet pipe, by-passes the inlet side of the valve and leads directly into the chamber on the outlet side. Flow through this pipe is controlled by a 1/8-inch globe valve. Opening this globe valve equalizes the pressure above and below the disk, thereby allowing the solenoid controlled valve to open. The globe valve is then closed and is ready for the next emergency. The new valve has a heavy cast body suitable for pressures up to 150 pounds and is furnished with Jenkins disk construction to handle steam, hot or cold water, gas, air, gasoline, or oil. The valve is available in six sizes ranging from 3/4-inch to 2 1/2 inches and may be used on 110-, 220-, or 440-volt 60-cycle lines.



(Left) Goodyear Tractionizer for Winterizing Tire Treads, and *(Right)* Magnified View of Perforated Tread after Treatment

Tire Tread Winterizer

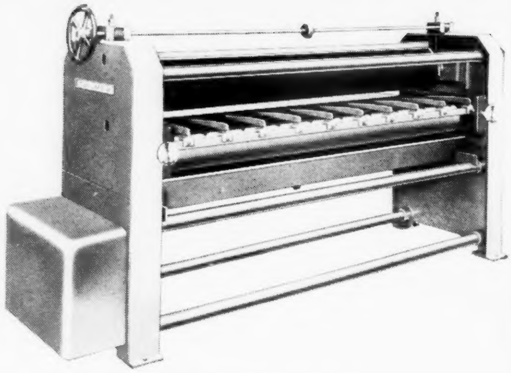
WINTER-GRIP tread, a new tire tread treatment recently developed by Goodyear Tire & Rubber Co., Akron, O., has now been made available to motorists for protection against the hazards of winter driving. This tread, shown in company tests to have greater skid resistance and better tractions than any type of tread previously tested, is obtained by means of a device known as the Goodyear Tractionizer. This Tractionizer, which requires 13 by 32 inches of floor space and weighs about 75 pounds, has two rollers which mechanically pierce the tire tread and leave thousands of small holes with depths of 1/8-3/16-inch.

In operation, the rear end of the car is jacked up, and each tire in turn is set down between the two rollers which are studded with hooked barbs 1/4-inch long. Powered by the car, the wheel is rotated, and the tread is given a multitude of tiny perforations that expose sharp edges to grip the road. The treatment is gaged to last the entire winter season for normal mileage requirements. A set of four passenger-car or pick-up truck tires, having a maximum tread width of six inches, can be given the winterizing treatment in less than one hour.

Improved Coating Machine

A NEW roll coating machine is being offered by Columbia Machinery & Engineering Corp., Hamilton, O., as an addition to its line of molding and laminating presses and glue mixers. The machine has a 10-inch coating roll and eight-inch doctor roll. The large coating roll reduces the angle of departure from the work, providing a more uniform spread, and the larger crotch affords greater capacity and easier control of the coating material being spread. The doctor roll revolves at a much lower speed than the coating roll, and this difference in roll speed produces a wiping action that contributes to evenness of spread. Precise depth of spread is set and maintained by adjustment of calibrated handwheels.

Both the coating and doctor rolls are driven through a positive chain-and-sprocket drive and geared-head motor. The motor and drive are fully enclosed and located outside the end frame. Rolls, tables, and troughs are easily removed for cleaning. Down pressure on the safety bars running the full length of the machine instantly stops and reverses the rolls. End frames are of heavy



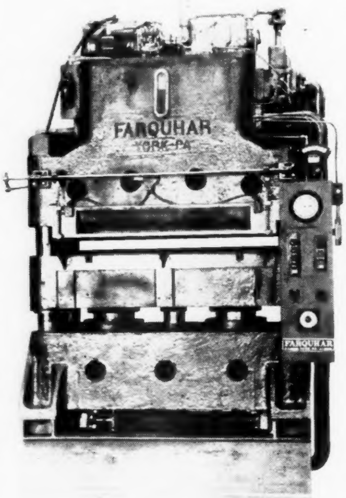
Columbia Roll Coating Machine

rolled steel plate electrically welded, and tie rods are of heavy wall steel tubing. The machines are regularly made in four-roll arrangements for coating one or both sides of a material, and in roll sizes from 32 to 104 inches, in six-inch increments, for handling material up to 102 inches wide. Material up to four inches thick can be accommodated. Various surface designs on the coating rolls and different drive speeds are available, and accessory equipment, such as a circulating pump unit or water-cooled storage reservoir, can also be furnished.

Embossing Press

A 300-TON self-contained hydraulic press is being made by A. B. Farquhar, York, Pa., for embossing plastic, rubber, leather, and many other coated fabrics. Requiring a minimum of floor space because it is self-contained, the press will perform work calling for very close tolerance and will give positive, reproducible results.

Automatic control permits pressure, stroke, temperature, and "dwell" to be individually adjusted to any predetermined requirements. When these have been fixed, control is entirely automatic and eliminates all guesswork on the part of the operator. All control buttons are conveniently located, it is also claimed. Other features of the press include an adjustable electric timing device which measures the time that the press will stay closed under pressure during the cure cycle and then sets the reversing mechanism in motion; positive safety guards, both front and back, with automatic shut-off to protect the operator; and accurate pressure control which safeguards the press against overloading and results in a minimum of maintenance.



Farquhar Hydraulic Embossing Press

"Popular Size Production Extruding Machines: No. 2, No. 3, No. 4." Bulletin No. 448. John Royle & Sons, 10 Essex St., Paterson 3, N. J. 8 pages. This bulletin describes, illustrates, and gives engineering specifications for the company's popular size extruding machines. These machines, associated most commonly with present-day extruding processes, are the Royle Nos. 2, 3, and 4, having cylinder bores of $3\frac{1}{4}$, $4\frac{1}{2}$, and 6 inches, respectively.

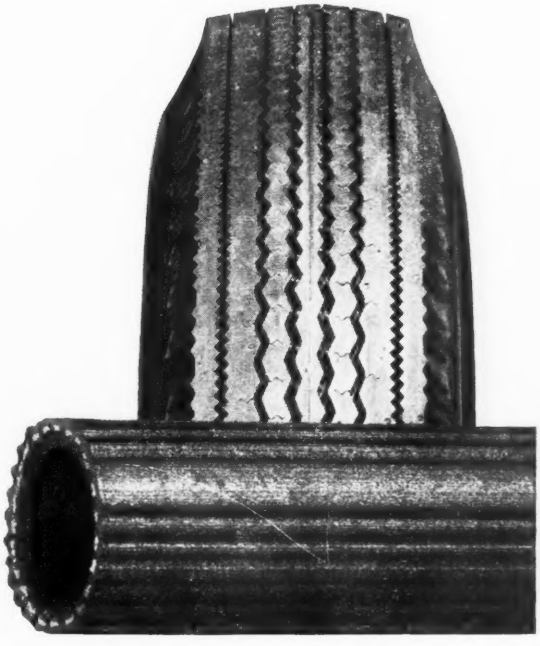
EL-SIXTY

VERSATILE ACCELERATOR FOR ALL RUBBER GOODS

Manufacturers of rubber products ranging from tires, tubes and mechanical goods to the finest of drug sundries will find that El-Sixty* offers them everything they need in an accelerator:

Safe handling
Wide versatility
Good performance in white and colored stocks
Ability to wade through retarding pigments
Excellent in pure gum or reclaim stock
Most stable accelerator in latex—causes no thickening in tanks

El-Sixty can be used alone or activated with Guantal,* Guanidines, Aldehydes, Thiurad,* or Thiurams. For full information, samples and prices, write to MONSANTO CHEMICAL COMPANY, Rubber Service Department, Second National Building, Akron 8, Ohio. If you prefer, simply return the coupon. *Reg. U. S. Pat. Off.



MONSANTO
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Rubber Service Department
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Please send me full information ( ); samples of El-Sixty ( ).

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SERVING INDUSTRY . . . WHICH SERVES MANKIND

New Goods and Specialties

Brake Lining

(Above) New Goodyear Two-Piece Brake Lining, and *(Below)* Conventional Lining

AN INNOVATION in the manufacture of brake linings by Goodyear Tire & Rubber Co., Akron, O., has resulted in a two-piece, heavy-duty brake block for full coverage truck and bus brake linings to replace the conventional one-piece unit per brake shoe. The new type of construction assures the same density of material throughout the entire surface of the lining, with the resultant advantage of long and even wear.

The new lining is made in both Goodyear All-Weather compound (plain block) and Goodyear YKL (brass chip compound). In the new lining the extremely small loss of braking area resulting from the open space between the two pieces is more than offset by the fact that the shorter arc offers the opportunity of molding a more efficient product.

Laboratory Apron

CLOTH woven of Fiberglas yarns and coated with a synthetic rubber is used by Fisher Scientific Co., Pittsburgh, Pa., and Eimer & Amend, New York, N. Y., for their new apron designed to provide laboratory workers with maximum protection. The apron is wide enough to protect the sides of the wearer from lateral splashing. It is designed to come to within four inches of the average wearer's neck and to hang about six inches above the floor. Possessing high tear strength, the coated Fiberglas cloth is resistant to burning and to all common laboratory reagents, it is claimed.

Plastic Balls

NEW Million-Air plastic footballs and playballs, made from pebble-grained, leather-like Vinylite, have been announced by U. S. Fiber & Plastics Corp., Stirling, N. J. The football is made of 0.022-gage plastic and can withstand the weight of a grown man, it is said. An ideal football for the younger child, it can be inflated with a bicycle pump. Complete with a plastic lace, the football will not crack or deteriorate with age and can be cleaned by wiping with a damp cloth, it is also claimed by the manufacturer.

The new playball is said to be the most rugged plastic ball ever made and will support the weight of several grown men. Also made of 0.022-gage plastic, the ball is 12 inches in diameter and is available in red and white, all red, all white, and leather-like tan. Aging and cleaning characteristics are identical with those of the plastic football.

SHELL DUTREX 6

Plasticizer and Extender for heavily loaded Natural Rubber Compounds

SHELL

Direct inquiries to:

SHELL OIL COMPANY, INCORPORATED

50 WEST 50th ST., NEW YORK 20, N. Y.
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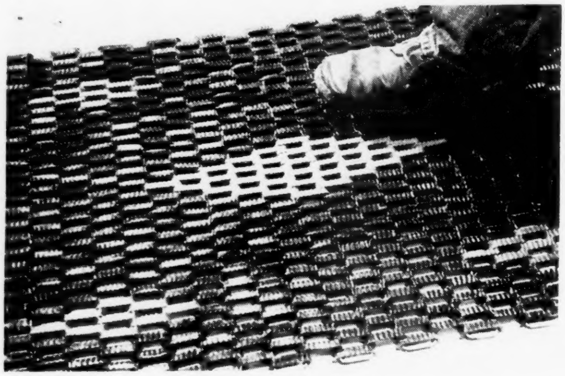
SHELL OIL COMPANY OF CANADA, LTD., 25 ADELAIDE ST., EAST TORONTO, CANADA
(Eastern Canada)

Million-Air Plastic Football and Playball

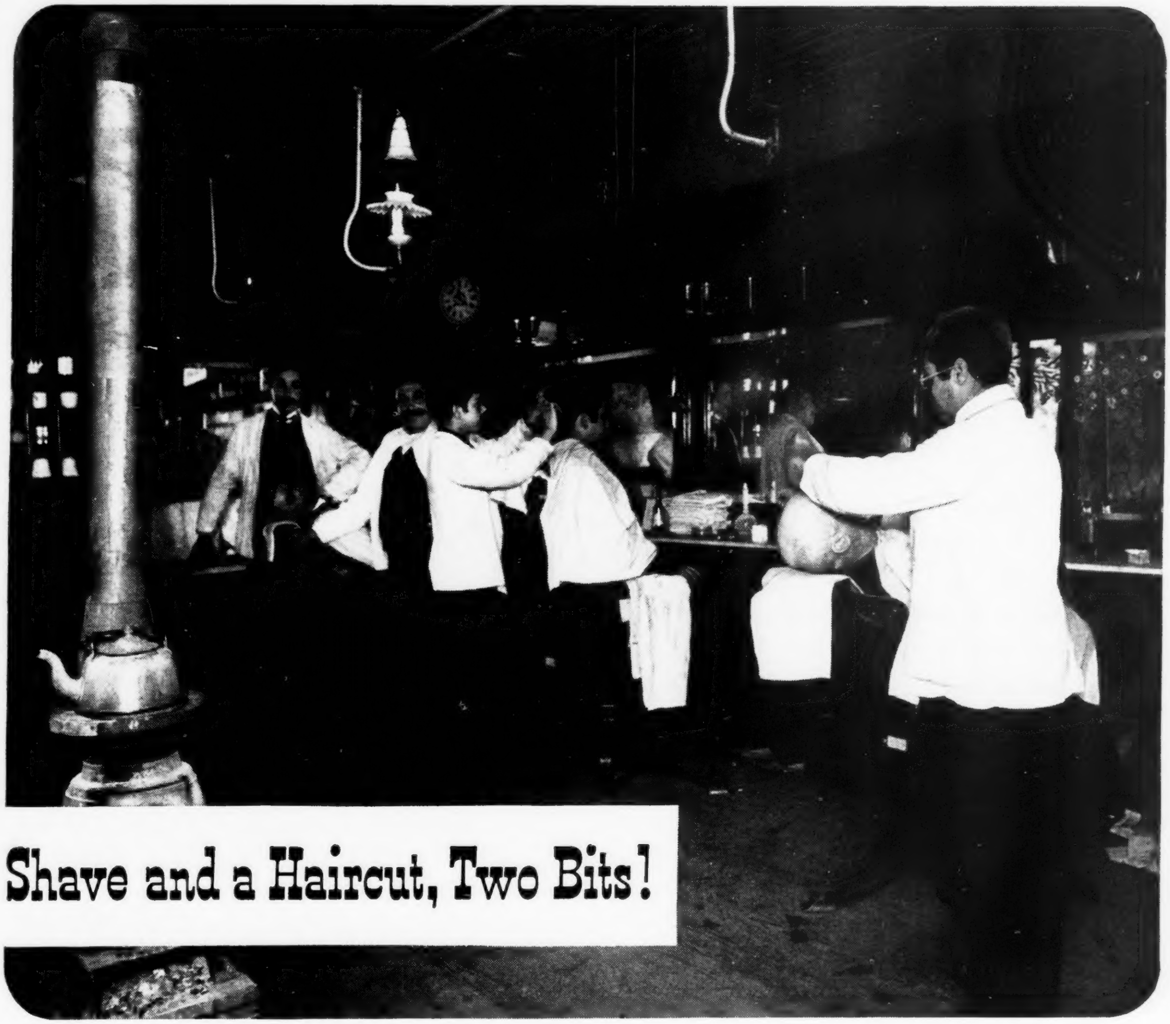


General Scientific's Akro-Mat

Corrugated Floor Mat

INDUSTRIAL rubber floor mats are being marketed by General Scientific Equipment Co., Philadelphia 32, Pa., under the name Akro-Mat. Made of specially compounded rubber links woven on 12-gage spring steel wire, the corrugated mats are said to provide sure, comfortable footing, prevent slipping accidents, and reduce worker fatigue. Akro-Mats are available in any desired length and in width up to 48 inches.

Akro-Mats are particularly adapted for use where moisture, oils, animal fats, acids, chemicals, solvents, or abrasives are present because the rubber resists deterioration. The mats are easy to clean and handle and may be rolled up when desired. They are finding wide industrial application as positive under-foot protection on walking surfaces, loading platforms, washroom floors, elevators, cat walks, ramps, landings, sidewalks, etc.



Shave and a Haircut, Two Bits!

The price of a haircut has gone up a lot since the nineties, and that's not all that has changed. Back in those "good old days" Esso Standard had just begun to study and experiment with light fraction petroleum refining... out of which came Esso Solvents.

ONE OF THESE SOLVENTS

is today used in the manufacture of razors, razor blades, and other rust-resistant metal products. Esso Solvents also play a role in many other industries . . . from automobiles to textiles, from rubber to wood preservatives . . . wherever uniform high quality and stability is required.

There are many grades of high quality Esso Solvents for many purposes. If you have any solvents problems, your nearest Esso Solvents sales representative will be glad to help you with them. Why not call or write us soon?

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Philadelphia, Pa.

EUROPE

GREAT BRITAIN

To Increase Output of Titanium Oxide

A huge £1,200,000 plant for the production of titanium oxide is under construction at Grimsby for British Titan Products Co., Ltd. The company already has a factory at Billingham with present annual output of 12,000 tons; however, the steady increase in demand for titanium oxide necessitated the erection of additional facilities, and about 2½ years ago construction was started on the new factory. The buildings occupy 26 acres of a 55-acre site, leaving ample land for future expansion. When the plant is in full running order, which may be by June, 1949, it will employ 300 workers and produce 10,000 tons a year of the latest rutile-type titanium oxide pigments, sufficient for domestic needs and for a considerable export business as well.

The type of titanium oxide to be produced at Grimsby will be known as Rutiox C R, which, it is claimed, will combine high strength, good color, high brightness, dispersion, durability, chalk resistance, and fading resistance, and will be the nearest approach to a universal pigment yet made.

The new factory has the advantage of being conveniently close to two important seaports—Grimsby and Immingham, through which the imports of rock sulfur from America and ilmenite ore from Norway and India will enter.

British Titan Products was formed in 1933 and originally had American affiliations. At present it is entirely British owned: Imperial Chemical Industries, Ltd., Imperial Smelting Corp., and Goodlass Wall & Lead Industries, each holding 30% of the stock; while R. W. Greeff & Co., holds the remaining 10%. The capital of £1,125,000 in ordinary shares has been increased by £1,000,000 of preferential shares, in the hands of insurance companies. A further increase in capital is planned to carry out developments on the Grimsby site. The company has established a factory in Tasmania and has also become interested in a factory at Travancore, Southern India, where the raw material is ready to hand. Future plans include the erection of additional large pyrite burning sulfuric acid plant for the manufacture of rutile-type titanium pigments extended with calcium sulfate in the anhydrite form.

Malaya Again a Subject for the House of Commons

In the latter part of September the situation in Malaya again came in for discussion in the House of Commons. On this occasion a point of debate was whether it was correct to label the disturbances in Malaya as activities of terrorist gangs or whether they are the products of insurrection.

Anthony Eden, speaking for the opposition, took the latter view and bluntly stated that there was a determined Communist attempt to seize power in Malaya, integrated with the Communist activities in Burma and in adjoining Siam. The objective, he said, was to overthrow law and order throughout southeastern Asia. Of the speakers who followed several more shared Mr. Eden's point of view. One member warned the government that unless law and order were fairly quickly restored, a breakdown of the production of tin and rubber throughout the country threatened. The government should not allow itself to be deceived by statistics, he went on to say; he himself had only just been informed that probably within a month a reduction in rubber outputs of 10,000 tons a month could be expected.

Another, who explained that he had a special interest in Malaya as he was a member of a firm responsible for shipping about 250,000 tons of rubber to the United States since the end of the war, agreed with Mr. Eden that the government faced an insurrection in Malaya. He then went on to discuss the warning issued by insurance companies to all connected with the shipment of rubber that because of the "state of insurrection" existing, holders of policies were not covered because the policies do not cover that contingency. Under those circumstances, he continued, producers of tin, rubber, etc. considered the risks too great and consequently were scrambling to escape the risk. But the government completely misunderstood the situation and dismissed warnings, pointing to increasing shipments as justification for its attitude. However the truth was, he said, that the "pipeline was being emptied as fast as possible; everybody was transferring everything they could even if unsold, so that it could be covered by a marine policy."

RECIPE

(Test No. 8408 from the Barrett Rubber Research Laboratory)

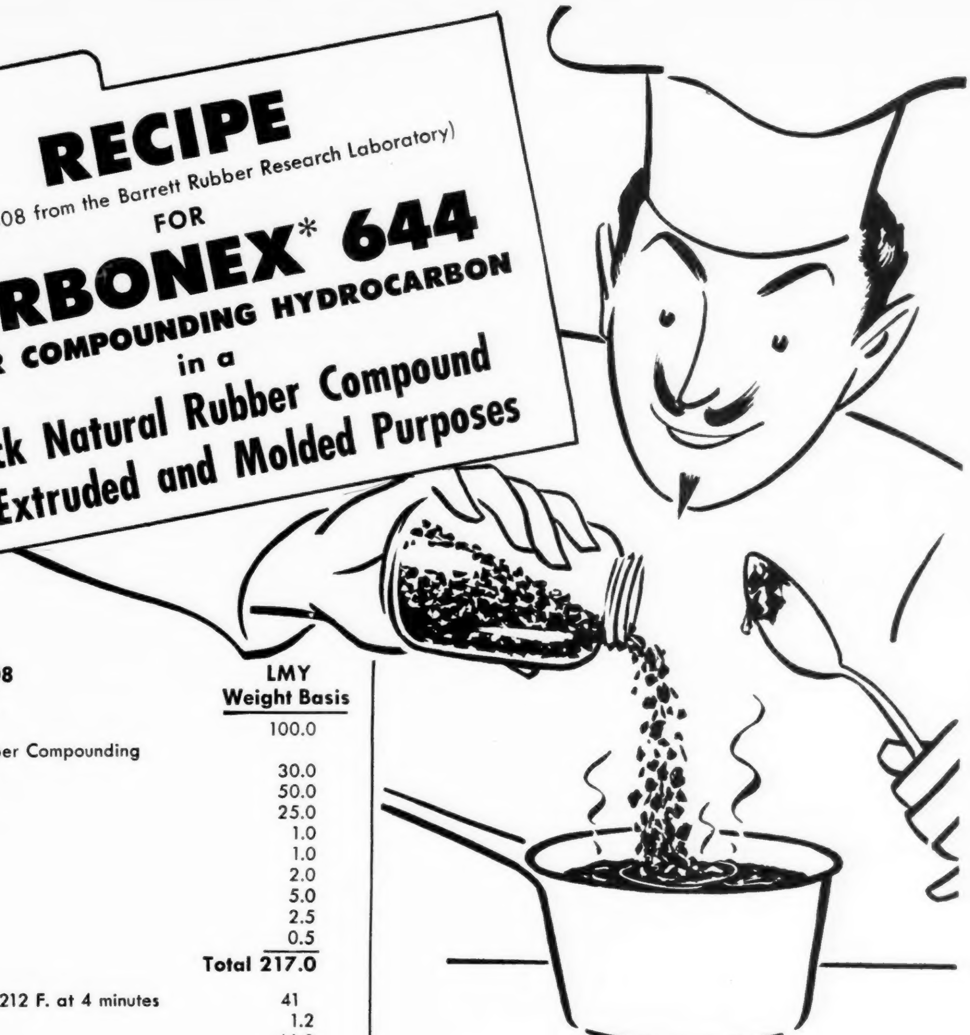
FOR

CARBONEX* 644

RUBBER COMPOUNDING HYDROCARBON

in a

Black Natural Rubber Compound for Extruded and Molded Purposes



Compound No. 8408

Recipe	LMY Weight Basis
Smoked Sheets	100.0
CARBONEX* 644 Rubber Compounding Hydrocarbon	30.0
Furnace Black (HMF)	50.0
"THERMAX" (MT)	25.0
"SUNPROOF"	1.0
"B-L-E" 25	1.0
Stearic Acid	2.0
Zinc Oxide	5.0
Sulfur	2.5
"SANTOCURE"	0.5
Total	**217.0**

Mooney Viscosity, ML., 212 F. at 4 minutes	41
Specific Gravity	1.2
RHC, % by weight	46.0
RHC, % by volume	60.2

Mooney Scorch, MS, 220 F.

Minutes	Viscosity
1	26
10	22
20	22

Press Cure at 316 F. (70 lb.)—10 Minutes

Tension and Hardness Data:	Unaged	Aged 14 Days at 70 C.
Stress at 300%, psi.	1350	1400
Tensile, psi.	2000	1550
Elongation, %	450	350
Permanent Set, %	26	22
Hardness, Shore A	75	81
Tear Resistance, Angle, Pounds per One Inch Thickness	175	125
†Abrasion Resistance, duPont, Cc. Loss per Hp-hr.	325	445
Cut-Growth Resistance, De Mattia, Inches per 100 Kilocycles	0.19	0.37
†Compression Set, 40% Constant Deflection, %	26.5	—
†Resilience, Yerzley, % Energy Recovery	66.5	63.0
†Impact Resilience, Goodyear—Healey Rebound Pendulum, % Rebound	53.0	54.9

†Specimens cured 15 minutes at 316 F. (70 lb.)

CARBONEX* 644 rubber compounding hydrocarbon, because of its exceptional plasticizing action, greatly modifies the nerve and consequently reduces the shrinkage of the elastomer, a property which recommends its application in extruded and molded items used in the automotive and aviation industry, mechanicals, heels and soles, etc.

CARBONEX* 644 rubber compounding hydrocarbon promotes smooth and rapid extrusion, allowing only small dimensional changes and providing sharp lines in molded goods. It disperses rapidly and improves processibility, and its extending properties recommend it for the design of low-cost quality compounds.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
In Canada: The Barrett Company, Ltd., 5551 St. Hubert St., Montreal, P. Q.

Barrett*

*Reg. U. S. Pat. Off.

Apropos of increased shipments, in Malaya one explanation offered for larger small-holder exports is that in the present situation outlying areas of estates must frequently be left quite unguarded, which policy results in illegal tapping, in other words, stealing of estate latex.

British Rubber Industry Notes

The E. & M. W. (Latex) Co. has been formed with a capital of £60,000 to provide storage facilities for rubber latex.

Pirelli General Cable Works reports profits, after allowing for depreciation, etc. of £1,236,559 for the year ended March 31, 1948, against £600,124 in the preceding fiscal year. Profits tax required £716,585, against £339,560; while £30,773 was allocated to general reserve; £200,000 to plant replacement, and £150,000 to stock reserve. The dividend was again 8% plus bonus of 12% less tax.

R. G. Newton, vice chairman of the London Section of the Institution of the Rubber Industry, and for ten years connected with the Research Association of British Rubber Manufacturers at Croydon, Surrey, has joined the British Rubber Producers' Research Association at Welwyn Garden City, Herts. Dr. Newton's new work will include administrative and liaison duties and the continuation of researches on the action of ozone as an important agent causing the deterioration of rubber articles.

GERMANY

Tire and Tube Output Increasing in Soviet Zone

Details have become available concerning plans for developing the production of tires in the Russian Zone of occupation in Germany. Press reports state that on February 9 an order went out from Marshall Sokolowiski, head of the Soviet Military Administration, to local government chiefs in the Soviet Zone requiring: (1) an increase in the productive capacity of the former Deka tire factory in Ketschendorf from about 75,000 tires annually to 150,000 automobile tires and an equal number of automobile tubes; (2) expansion of production at the Riesa Rubber Works to an annual output of 30,000 automobile tires and 40,000 tubes, for which purpose a dismantled perfume factory was to be placed at the firm's disposal, (3) production of tires to be organized at Reifen Muller, Berlin-Schmöckwitz, to the extent of 25,000 automobile tires and 30,000 automobile tubes annually, (4) increased production of automobile tires by the Deutsche Gummiwarenfabrik Degufrah to annual output of 90,000 tires; (5) increased production of valves and inserts for automobile tubes by the firms "Elster" (Berlin-Mitte) and "Alwin Lingot" (Berlin Pankow) to annual output of 350,000 pieces; the firms are to be assured of a supply of metals up to 22 tons a quarter, as well as other raw materials, fuel, power, and adequate labor force.

The realization of the plan calls for considerable amounts of new equipment, especially in the case of Reifen Muller and Gummiwerk Riesa, which have hitherto been chiefly engaged in repairing and retreading tires. Consequently the machinery manufacturers, Schirm of Leipzig and Haubold of Chemnitz, are to resume the construction of machinery for the rubber industry, while the Soviet concern, Kraska, is to arrange for the production of 150 tons of Vulkacit annually in the Farbenfabrik Wolfen. Finally, the appropriate authorities are to see to it that tire manufacturers receive an uninterrupted supply of the necessary chemicals and other ingredients.

Toxicity of Soft Igelit

Of late much discussion has appeared in the local daily press of poisoning due to Igelit (polyvinylchloride) products; so the editors of *Kautschuk und Gummi* requested the research department of the Buna Chemical Works, Schkopau, for a statement on the subject which was published. According to this statement, non-plasticized or hard Igelit, also known as Vinidur, is non-toxic and harmless from this standpoint. It is admitted, however, that among the plasticizers used for softened Igelit is tricresylphosphate, a dangerous nerve poison if swallowed in the fluid state, and safety and health regulations therefore require that the fluid substance be tinted blue. Soft Igelit

prepared with tricresylphosphate may produce harmful results if the plasticizer is dissolved out by fatty substances or organic solvents and is carried by these substances to the digestive tract via the mouth. Manufacturers, in consequence, are forbidden to employ it in soft Igelit articles that may come in contact with edibles or in toys for children.

The present shortage of suitable raw materials has limited the production and use of the non-toxic softeners for Igelit, but it is pointed out that even when full production of the safe materials is assured, tricresylphosphate will continue to find a use because it has special qualities which make it indispensable for the production of Igelit articles for industrial purposes.

Tire Production in Bizonia

Tire production is said to be exceeding the quota of 123,000 tires monthly for 1948, fixed by the Commerce & Industry Branch of the Bipartite Control Office. While it was expected that this amount would not be reached until June, 1948, actual production came to 122,733 tires in February, 1948, 126,173 in March, 153,000 in April, 109,000 in May, 131,000 in June, and 186,098 in July. Western Germany needs 2,500,000 tires of all kinds, and the present rate of production is held to indicate that this area can become self-sufficient with regard to tires by January, 1949, if not sooner.

The increased rate of tire production has necessitated a revision of the import schedule which originally provided for imports of 34,800 tons of crude rubber annually. During the first half of 1948 about 28,000 tons were received, and under the present schedule about 60,000 tons will be imported during the 12-month period, July 1, 1948—June 30, 1949.

German Industry Notes

A first move has been made toward establishing a patent office serving the Western Zones of Germany. On October 1, 1948, a filing office was set up in Darmstadt which will receive applications for patents and for the registration of designs and trade marks. For the present, at least, patent material will not be published.

The Hutchinson Rubber Goods Factory at Mannheim has resumed the manufacture of rubber footwear; cycle tires are also being made again, but on a limited scale.

POLAND

Under the three-year plan a total of 66 billion zloty (about 165 million dollars) is to be invested in 1948 in industries considered especially important for Poland's general economy. Of this amount 7.8 billion zloty, (19.5 million dollars) more than three times the 1947 total, have been allotted to the chemical industry, recent reports indicate.

It is estimated that not quite 12% of the total number of chemical establishments in what is now Poland is government property, but these are by far the largest and employ about two thirds of the total labor force, a proportion that will become still larger when government plans have been fulfilled. The government chemical factories, 187 in number, include 20 establishments for the production of rubber goods and plastics, of which all but five were operating in 1947; there are also 25 factories for pharmaceuticals and organic chemicals, of which 21 were operating last year. The large number of small privately owned factories included 164 which worked on plastics.

A very important part of the present Polish chemical industry is formed by the 64 former German factories which are now in Polish territory and have been taken over by the government. A number of these suffered severely in the war, and by far the greater part of the subsidies mentioned above is to go toward rehabilitation and expansion of these factories. It is expected that when this work has been completed (by 1949), these factories will account for about 30% of Poland's chemical output; their production is to include acetylene derivatives, Buna rubber, plastics, and a number of other products formerly manufactured in Poland on a very small scale or not at all, and the government expects to be able to cover the greater part of domestic needs and to have a considerable surplus available for export. The former "Anorgana" works in Dyhernfurth, near Breslau, is now the "Rokita" works and is being expanded so that it will be the largest Polish factory for organic chemical

products, with manufactures including a large variety of products such as ethylene, benzol, toluol, naphthalene, chlorination products and various derivatives; acetic acid anhydride, and plastics, among many others.

Rubber goods factories are included among the chemical industries, and in 1946 they employed 4,000 persons and used 26,000 tons of rubber, of which only 8% was natural rubber. However the lower prices prevailing for natural rubber are said to have caused Polish manufacturers of late to increase their consumption of natural rubber to 50%.

At the same time it may be noted that the ambitious plans for plant construction at Dwory, near Auschwitz, centering around the production of synthetic benzine, include erection of establishments for manufacturing carbide, plastics, acetylene, and other organo-chemical products as well as Buna.

A comparison of the production of various products, including rubber goods, in 1946 and 1947 follows: tires, 511 tons in 1946 and 1,406 tons in 1947; tubes, 62 and 217 tons; rubber footwear, 412 and 1,152 tons; rubber soles, 1,090 and 1,996 tons; driving belts, 341 and 993 tons, respectively. According to a British source, outputs of rubber goods during the first quarter of 1948 included 512 tons of tires and 103 tons of tubes for automobiles and motor cycles; 367 tons of tires and 108 tons of tubes for bicycles; and 481 tons of belts and conveyers.

The Polish rubber industry is said to be planning to export automobile tires and cycle tubes and is also contemplating large-scale exports of rubber footwear. In the latter connection it may be recalled shortly after the first World War, Poland suddenly developed into an important producer of rubber footwear.

The Central Board of the Sugar Industry, Poland, is to establish a plant for the production of acetone and butyl alcohol, it is reported.

HOLLAND

The N. V. Tank Industry was recently founded by the Netherlands Steamship Co. and the Rubber Plantations Co., Amsterdam, to facilitate the shipment and storage of latex in bulk. To this end 14 latex storage tanks will be built in the Port of Amsterdam, and construction on the first tank has started.

From September 21-25 an International Rheological Congress was held at The Hague, attended by 234 delegates from several countries. Ninety-nine were Dutch, but 81 were from Great Britain, 23 from France, and eight from the United States. Of the comparatively large number of papers presented several were of special interest to research workers on rubber and plastics, including papers on the viscosity of high polymer solutions, the effect of filler particles, plasticity measurements, and the hardening and softening action of certain amino compounds on rubber. On this occasion also a fine exhibit of rheological instruments was to be seen, including, besides well-known viscosimeters and plastometers, a number of specialized and new instruments.

The two Amsterdam concerns, Loeber and Watering, respectively, which together control about 25 Indonesian estates, chiefly tea, quinine, and rubber, are to form a new combine with a capital of 22,000,000 to 25,000,000 guilders.

BELGIUM

A variety of plastic products was shown by Belgian and foreign firms at the International Plastics Exhibition held in Brussels from May 29 to June 13, 1948. The Belgian Formica concern displayed extruded and molded goods made from polystyrene, Plexiglas, and artificial horn. Coveta, representing various companies, showed machines for welding seams in the manufacture of raincapes and air cushions of plastic material; also the vinyl resin, Gheyselit, manufactured by the Belgian firm, Usines Gheysen, in the form of sheets, tubing, and extrusions for various industrial purposes; and also handsome colorful flooring by Delysfloor. Rohm & Haas (of Philadelphia, Pa., U.S.A.), represented by Camille Honbon, had a number of products of Plexiglas and injection moldings of Plexine and polystyrene, which various foreign firms, especially Belgian, work up. The firms, Noveltex and Valentin, featured electric cables, tubing for covering multiples cable conductors for automobiles and radios, and also fancy belts and bands of polyethylene.

Of special interest were wall panelings of polystyrene made by Faveco of Luxemburg. The panels are 100 by 100 millimeters

in size and have extensions on two sides to permit the panels to be cemented together with suitable solvents; while pegs of polystyrene are provided for attaching the panels to the walls. An advantage of using these panels, it is said, is that they demand no preliminary treatment of the walls.

The exhibition also had a number of processing machines, including extruders of German design, but British manufacture, a hydraulic press with single drive by the Swiss firm, Netstal, automatic presses by the Swiss firm, Tavannse, electrical heaters, hand presses and preheating apparatus from Force & Chauffage of Brussels.

At the extraordinary meeting of the S. A. Belge du Pneumatique Michelin, held in Brussels in the summer, it was decided to raise the capital from 30,000,000 to 60,000,000 francs by incorporation of revaluation reserves and the creation of 60,000 new shares of 500 francs each. These shares are to be assigned gratuitously to holders of the 60,000 old shares, of which 59,945 belong to the Soc. Manufacture de Caoutchouc Michelin (Puiseux, Boulanger & Cie.)

SWEDEN

Sweden imported 5,432 tons of crude rubber in the first half of 1948 in addition to 430 tons of ebonite powder and scrap rubber, as compared with 6,242 tons of crude rubber and 323 tons of ebonite and scrap rubber in the first half of 1947. The imports of rubber goods included 37 tons of heels and soles in the 1948 period, against 55 tons in the 1947 period; 605 tons of hose and tubing, against 449 tons; 511 tons of belting, against 563 tons; 415 tons of tires and accessories for cycles, against 65 tons; 1,885 tons against 4,230 tons of tires and accessories for motor vehicles; and 76, against 254 tons of other rubber articles including surgical rubber goods. Among the footwear imports were 342 tons of galoshes and other rubber shoes, and 5 tons of rubber-soled footwear, against 692 tons and 218 tons, respectively.

Exports of rubber manufactures, relatively unimportant, consisted chiefly of rubber footwear (28, against 48 tons) and rubber-soled shoes (13, against 11 tons), besides still smaller amounts of mechanical rubber goods.

The above figures indicate an all-round decrease in Sweden's rubber trade during the first half of 1948, especially marked in the case of imports of tires and other automobile accessories and of footwear.

CZECHOSLOVAKIA

Czechoslovakia's nationalization plans for the chemical industry have reportedly now been extended to include the production of paints, plastics, adhesives, and textile and leather auxiliaries.

According to European press reports, the export company, Kotva, founded by the Bata company in Zlin in 1936 and formerly responsible for purchasing raw materials and exporting the manufactures of Bata, has now become the exporting organization for the entire nationalized leather and rubber industry of Czechoslovakia. A staff of 70 additional export experts has been appointed, and seven buying and selling sections are to be established, with an eighth one to be devoted exclusively to the trade with Russia.

SPAIN

Judging by available statistics, Spain's imports of natural and synthetic rubber underwent a considerable decline in the first four months of 1948, when arrivals were said to have totaled 2,489 tons, against 7,603 tons in the corresponding period last year. For all of 1946, total import figures of 9,604 metric tons are mentioned. About half the imported rubber goes into tires and tubes, monthly production of which is said by trade papers to include more than 50,000 automobile and truck casings. Government estimates are much lower, 37,000 units a month. In any event it seems present output of these goods is considerably higher than the prewar monthly average of 25,000 units.

NORWAY

A formaldehyde plant is being erected by the Norske Kunstharpikser A.S. at Lillestrom, near the site chosen for a new synthetic resin factory which the company plans to build. The formaldehyde plant is to have a maximum capacity of 6,000 metric tons of 30% formaldehyde and is expected to be ready to start operations this year.

Study of possibilities for developing a synthetic-organic-chemical industry in Norway is being sponsored by eight member firms of the Research Society for Norwegian Industry, who have provided the necessary funds. A United States expert is to undertake the research, and others are being consulted, it is reported, and it seems that German data have already been collected.

RUMANIA

Production of chemicals in Rumania in 1947 included 214 metric tons of ammonium sulfate, 1,107 tons of carbon black, and 162 tons (for eleven months) of formaldehyde. The first two items exceeded the quota set up under planned production, but the output of formaldehyde was only about 58% of the quota set.

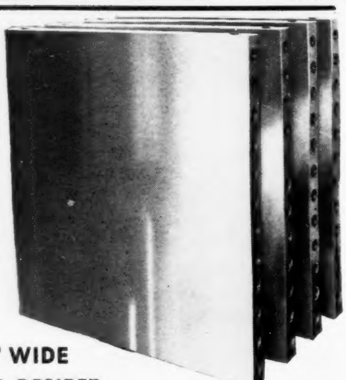
Planned monthly output of rubber goods during the six months from April 1 to September 30, 1948, reportedly included 100 tons of automobile tires and tubes in April and 130 tons thereafter; 8,333 cycle tires; 11,667 cycle tubes; 50 tons of thick rubber sheets; 7½ tons rubber heels; 2,999 pairs rubber boots; 40,800 pairs galoshes; 3 tons pencil erasers; one ton elastic thread; 12 tons Klingerit packing; 40 tons other rubber manufactures; and 7½ tons insulating material.

DENMARK

The new Danish-Italian agreement for exchange of goods, signed in Copenhagen, June 18, 1948, to remain in force until May 31, 1948, provides for the export by Italy to Denmark of motorcycles, bicycles, and parts to a value of 1,400,000 Danish crowns, and of tires to a value of 1,000,000 Danish crowns.

FRANCE

Société Française pour l'Entreposage du Latex (French Society for Bonding or Warehousing Latex) is a limited liability company recently formed with a capital of 25,000,000 francs



divided into 50,000 shares of 500 francs each. As managers of the new undertaking are Soc. Financiere des Caoutchouc, Compagnie du Cambodge, Caoutchoucs de Padang, Plantations de Terres Rouges, Soc. du Port de Rosario, and Messrs. de Solages, L. Dupre, and Pierre Watteau.

AFRICA

The Torr-Gericke Rubber, Ltd., of South Africa exploits a new process for preparing crude rubber by electrical means. Recently raw rubber samples received from the firm's technicians in the Belgian Congo were sent to two internationally known rubber manufacturing companies for preliminary testing by both chemical and physical means. The samples included, besides a control sample of acid-coagulated and smoked rubber, (not the company's rubber) two types of rubber prepared by the Torr-Gericke process, one sample being electrically coagulated and electrically dried, while the other was only electrically coagulated, but smoke-cured.

According to the report of one of the manufacturing companies, the predominant features of the electrically coagulated rubber are its very fast rate of vulcanization, as compared with Far Eastern first-quality smoked sheet, together with very good tensile strength. It is suggested, however, that the electrical treatment is not wholly responsible for the features mentioned, as these are evident, in a less marked degree, in the type of rubber, which was coagulated with acid.

The company added that the results obtained from these preliminary samples gave results warranting further development work and that it was prepared to test further samples as soon as received.

The second company received samples only of the second and third types, that is, not the 100% electrically prepared sample. As compared with Ribbed Smoked Sheet Nos. 1 and 2, the electrically coagulated sample was found to be faster curing, to have higher retention of rubber resins and fatty acids, have good color, to be clean, but to have slightly inferior aging characteristics. The company's technical director is quoted as saying the following:

"These results dispel . . . any impression that the electric treatment has any deleterious effect on the chemical and physical properties of the rubber produced. The high tensile strength and fast rate of vulcanization of Torr-Gericke rubber are its most important features, and the test results are very encouraging as the rubber tested was only the product of the second commercial scale test."

E. L. Gericke, of the Torr-Gericke concern, is confident that the rubber will be still further improved by the electric process, once the necessary adjustments to the first large-scale plant have been made.

The Goodyear Rubber & Tire Co. at Uitenhage, which has now been operating for a year, is producing transmission and conveyer belting, various types of industrial hose, and also tires for farm use. The factory employs more than 600 South Africans, and South Africans are being put into supervisory positions as fast as they are trained, so that the original American staff of 32 has already been reduced to 12; the rest have returned to America.

Work is under way on the construction of the new factory of the recently formed General Tire & Rubber Co. (South Africa), Ltd., at Port Elizabeth. The company, which has contracted to manufacture tires for the United States Rubber Co. (South Africa), Ltd., expects to be able to start production next January. At the outset it will get technical assistance from The General Tire & Rubber Co., Akron, O., U.S.A., but it is planned to make the new concern, which has largely been financed by South African money, an essentially South African undertaking.

The Camperdown Insulation Co. (Pty.) Ltd., Port Elizabeth, is preparing to manufacture Isoflex insulation material for use in refrigeration, air conditioning, and transport installations. Isoflex is made by a Swedish process according to which air layers are separated by thin plastic sheets, yielding a material said to weigh less than one pound per cubic foot.

Interest in the manufacture of plastics is gaining here, and several new companies have been formed. Among the newest is the Poly-Resin Products Co., Ltd., Cape Town, which expects to produce a complete range of synthetic resins for the paint, plywood, paper, electrical, building, leather, and allied industries. British technicians will supervise production as well as technical service.

FAR EAST

FRENCH INDO-CHINA

Judging by recent figures, exports from Indo-China are tending to increase. Available figures from different sources do not agree on the actual amounts shipped in the first seven months of 1948; one source puts the figure at 21,972 metric tons and another at 24,147 tons. It should be noted that the totals still include a considerable amount of rubber from stocks accumulated by private purchasers in 1944-45. Total exports in 1947 came to 51,313 metric tons.

The important rubber companies operating in Indo-China report outputs totaling 15,797 tons in the first half of 1948. Preliminary figures for July, at 3,419 metric tons, would bring the total to 19,216 metric tons for the seven-month period, which compares with 16,406 metric tons for the first seven months of 1947.

Some rubber manufacturing seems to be undertaken in Indo-China, and 704 metric tons were used locally in the first half of 1948.

AUSTRALIA

The rubber manufacturing firm of Kenworth (Australia), Ltd., has been converted into a public company, and the nominal capital of £150,000 has been increased to £500,000.

Swift Mfg. Co., Kensington, Victoria, a subsidiary of the English Swift Tennis Ball Co., manufactures a wide range of molded rubber products. The parent company extended its manufacturing by granting licenses to various overseas factories.

Australia's requirements of acetylene black are now being filled by Electronic Industries, Ltd., of Australia. The company produces the black at Electrona, not far from Hobart, Tasmania, under license from the Shawinigan Products, Ltd., Montreal, P. Q., Canada.

A serious shortage of coal in Australia has hit all industrial undertakings. An order issued by the Joint Coal Board limits the use of coal by manufacturers of rubber, cables, or batteries to 65% of normal coal consumption. Naturally gas and electricity supplies are also affected.

A big German plastics plant built in 1941 and used to make aircraft and radio fittings has been brought to Australia as reparations from Germany. The plant, which includes a 5,000-ton press 50 feet high, as well as latest-type mixing and rolling machines, is to be sold by the Commonwealth Disposals Commission.

Rubber Elastics, Ltd., of Australia, has been converted into a public company with an authorized capital of £500,000; issued capital is reported at £300,000 in 1,200,000 5s. shares. The company makes net elastic, elastic yarns, tubular and flat elastic fabrics, corset elastic and French elastic corsets, and surgical stockings. Subsidiaries of the company are Hermes Trading Co. Pty., Ltd., C. McLennon & Sons, Ptd., Ltd., and Surgical Hosiery Co., Ltd.

The Olympic Tire & Rubber Co. reports peak profits and sales for the business year ended June, 1948. After allowing £84,091 for depreciation, £175,000 for possible reduction in value of stocks of raw material, and £210,000 for taxation, the company showed a net profit of £134,665. Comparable figures for 1946-47, which included six months' trading of the cable division, were £87,776 for depreciation, £162,000 for taxation, and net profit £108,166. In both years dividend on ordinary shares was 14%.

"Compounding with Vistac #1." Advance Solvents & Chemical Corp., 245 Fifth Ave., New York 16, N. Y. 48 pages. This is a comprehensive report on typical formulations and results obtained using Vistac #1 in different natural rubber and GR-S stocks. Fifteen types of natural rubber compounds, ranging from tire sidewalls to sponge rubber, are covered, and six types of GR-S compounds are also discussed. Included, too, are a brief description of Advawax 2575, a 25:75 Vistanex-paraffin wax masterbatch, and a list of Vistac #1 sales agents.

Editor's Book Table

BOOK REVIEWS

"The Rubber Industry—A Study in Competition and Monopoly." P. T. Bauer. Harvard University Press, Cambridge, Mass. 1948. Cloth, 6 by 9 inches, 404 pages. Price $7.50.

As the sub-title of this book indicates, we have here a study of competition and monopoly in the rubber industry. Mr. Bauer begins by pointing out that some form of organized restriction of output was in force in the rubber industry for at least part of every year between the end of the first world war (when the industry had only just been established) and the end of 1928, and that the only period of free competition for plantation rubber since the industry assumed any importance fell between 1929 and 1933. This period serves as the starting point for the work under review. It was also the period in which the great depression set in, gathering momentum as it continued, finally forcing rubber growers to adopt a new regulation scheme, and the negotiations, establishment, and working of regulation form the main part of the study.

To provide the necessary background a brief exposition of the structure of the rubber industry in 1929-1933 is given, followed by a review of the impact of the depression on the Far Eastern rubber areas, production during the rubber slump, and the position of the smallholder. Mr. Bauer notes that the depression hit Netherlands India just as badly as it did Malaya and Ceylon, despite a diversified economy often held up as an example for the latter territories to follow, and the implication seems to be that events had justified the policy of specialization preferred by the latter. To an impartial observer, however, they would simply constitute proof of the severity and the inclusiveness of the depression, rather than of the wisdom of specialization as opposed to diversification. It may be pertinent to recall that the price of not one of the products cited by Mr. Bauer as suffering equally in the depression with rubber (coffee, sugar, tobacco, copra, cinchona, tea) fell so rapidly or so steeply as did that of rubber.

As readers of India RUBBER WORLD probably know from articles by Mr. Bauer, he has made a special study of the position of smallholders, particularly in Malaya and Netherlands India. In this work he again exposes the widespread misunderstanding of the conditions of production on smallholdings and the consequent failure of estimates to approach anything like the facts as to probable native rubber production, particularly in Netherlands India; and, incidentally, he provides an excellent picture of rubber growing as practiced by the smallholder in Malaya and Netherlands India. To be sure he seems at times to be carried away by an exaggerated sense of the extent of the injustice done to smallholders, but on the whole he misses few of the implications involved.

The sections of the book dealing with the long drawn-out negotiations which finally led to the establishment of international regulation, the establishment of the scheme, and the way it worked in prosperity and recession are detailed, highly revelatory and quite unsparing.

The problems of labor and the possibilities for improved methods on estates are next dealt with. In connection with the latter the author finds opportunity to say a good word for the agency system, to balance some of his own criticism earlier in the book. Shorn of its abuses, he believes, the system is more likely to survive on its merits (with estates capable of freely competing with smallholders) than its critics assume. He takes a tilt at the Rubber Research Institute of Malaya for its ignorance about smallholders and negligence of their interests.

The threat of synthetic rubber and the prospects and future policies of the industry, especially in Malaya, form the subjects of the final parts of the book. Mr. Bauer would like to see a period of price competition, which he feels is long overdue in what is essentially an undeveloped industry, and coupled with it a buffer stock to eliminate excessive price fluctuations. The price competition period is needed "partly to spur efficiency, but also for classification of relative efficiences in terms of long-period supply prices of different classes of producers."

This belief does not prevent him from foreseeing the need of resumption of restriction either if the American market were close to the natural rubber industry (by protection of synthetic rubber) or if the economic system of the future turns out to be largely monopolistic, or finally if, in the interests of its high-cost synthetic plants, America insists on restriction of natural rubber to raise the price of the latter.

In the specific case of the future of Malayan rubber, the main

solution is a change of policy toward the smallholder, involving encouragement of large-scale new planting.

The book closes with much supplementary statistical data and an index.

One cannot agree with Mr. Bauer on all points—his over-awareness of the importance of plantation rubber to British economy and his consequent preoccupation with the need of protecting Malayan rubber from the double threat of American synthetic rubber and native rubber in Netherlands India, at times lead him astray. But he stimulates thought, and the thoroughness of his study, the wealth of facts and figures he presents make his book a must for all those interested in the plantation rubber industry.

"Manual for Process Engineering Calculations." Loyal Clarke. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. Cloth, 6 by 9 inches, 446 pages. Price, $6.

This manual gives engineers and chemists a comprehensive and handy source of concise, practical data to aid in engineering the development of chemical processes from initial research to final design. As the author states, every process engineer has his own file of useful data charts and other material in condensed, ready reference form. This book is essentially such a set of notes giving working data for rapid process calculations and as such emphasizes condensed methods of presentation. The material covered includes numerical and mathematical data; conversion tables; physical and mechanical properties; thermodynamic data; piping, hydraulics, and flow measurements; heat transfer; combustion; power; pumps; fans, blowers, and compressors; and absorption, stripping, and distillation. The subject matter is presented in logical form, and its value is aided by the inclusion of numerous charts and tables, references to more complete texts, and the use of explanatory examples. The book will be of value to all chemists and should prove indispensable to process engineers.

"The Genius of Industrial Research." D. H. Killeffer. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. Cloth, 6 by 9 inches, 270 pages. Price, $4.50.

This book, a discussion of modern industrial research and its methods, is intended primarily for the undergraduate technical student to teach him what to expect in industry research work. The author begins by emphasizing the methodical nature of research and pointing out the differences between pure and applied research. After a consideration of the need of keeping everyday research work clearly defined in terms of the ultimate objective, chapters follow devoted to different types of research, including process research, product research, equipment research, and pilot-plant work. Finally, there are chapters covering report writing, research evaluation, and patents. The text consists of a running commentary interspersed with stories of actual research works in the words of their authors. In such fashion are described the research efforts that produced rubber accelerators, synthetic rubber, the first synthetic plastic, high-octane gasoline, the gas-filled tungsten filament electric lamp, modern refrigerants, and many other developments.

NEW PUBLICATIONS

"Plasticizer TP-95 in Buna N Rubber and Synthetic Resins." Technical Service Bulletin No. 105. Thiokol Corp., Trenton, N. J. 2 pages. This bulletin gives the physical properties of TP-95, laboratory test data on its use in nitrile rubber, including formulations and vulcanizate properties, and a table of compatibility of the material with cellulose and vinyl resins.

"Kalabond RM-1, A New-Type Rubber-to-Metal Adhesive." General Tire & Rubber Co., Akron, O. October 29, 1948. 2 pages. Kalabond RM-1, a new rubbery polymer-based adhesive for rubber-to-metal bonding, is described herein. The adhesive cures to form a positive, chemical bond that imparts anti-corrosive properties to the metal surface. Information is given on bonding materials and properties, compounding requirements, metal preparation, and application of the adhesive.

"Chlorine." Columbia Chemical Division, Pittsburgh Plate Glass Co., Pittsburgh 22, Pa. 72 pages. This handsome, illustrated manual covers the history and growth of the chlorine industry, the manufacture of chlorine, methods of handling and unloading chlorine containers, and technical data on chlorine.

"Zinc Oxide—Properties and Commercial Applications." St. Joseph Lead Co. of Pennsylvania, Josephtown, Pa. 24 pages. Prepared by the company's technical staff under the direction of J. J. Rankin and R. S. Havenhill, this booklet discusses the physical and chemical properties of zinc oxide and its use in rubber compounds, protective coatings, ceramics, and other industrial applications. Among the topics discussed under rubber are activation, reinforcement, effect of zinc oxide impurities, low heat generation, and aging. Photomicrographs and electron micrographs of the company's various zinc oxides are also included.

"Experiments on Tractor Tire Performance." British Rubber Development Board, Market Bldgs., Mark Lane, London E.C.3, England. 24 pages. This booklet reports on tractor tire tests made during 1947 by the National Institute of Agricultural Engineering (British). The report includes scope of tests, types of terrain, test results with deflection curves, a discussion of results, and conclusions derived.

"Specifications for Silastic Insulated Lead Cable." Preliminary Data Sheet G-6, October 1, 1948. Dow Corning Corp., Midland, Mich. 4 pages. This purchase specification for Silastic insulated lead cable covers conductors, insulation, braid, braid saturant, markers, colors, dimensions, tests, and packaging.

Bulletins of Ohio-Apex, Inc., Nitro, W. Va. **"Adipol 10A Plasticizer."** 4 pages. **"D.I.O.P. Plasticizer."** 4 pages. These bulletins give the properties of the company's two new plasticizers, results obtained with polyvinyl chloride plastic, compatibilities with synthetic rubbers and resins, and their application to give permanent low-temperature flexibility, easy processing, good electrical properties, good heat and ultra-violet stability, and low water extraction.

"Neoprene White Sidewalls." BL-228, November 1, 1948. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. 4 pages. A recommended formulation for neoprene-natural rubber white sidewalls is given together with data on the resistance of this compound to sunlight and aging. The effect of compounding variations is discussed, and a mixing procedure suggested.

"The Story of the Tire." Twelfth and Golden Jubilee Edition. Goodyear Tire & Rubber Co., Akron 16, O. 64 pages. This illustrated booklet, written for the layman, describes the company's history, research work, and manpower; the growing of natural rubber; synthetic rubber development; the steps in the production of automobile tires, tire fabrics, and inner tubes; tire development; and tire marketing.

"All-Hydraulic Presses for Metal Working and Process Industries." Bulletin 4804. Hydraulic Press Mfg. Co., Mount Gilead, O. 12 pages. This illustrated bulletin describes the company's line of presses, including rubber injection molding machines, plastics injection, compression, and transfer presses, metal working presses, and presses for the chemical process industries.

Publications of the British Rubber Producers' Research Association, 48 Tewin Rd., Welwyn Garden City, Herts., England. **"Large Elastic Deformations of Isotropic Materials. Part III. Some Simple Problems in Cylindrical Polar Coordinates."** R. S. Rivlin. Publication No. 94. 20 pages. The theory developed in Part I is applied to the solution of the problem of the simple torsion of a cylinder and tube of highly elastic material. It is found necessary to apply longitudinal thrusts in addition to a torsional couple to avoid cylinder elongation. For a tube, an inflating pressure must also be applied.

"The Dielectric Relaxation of Mixtures of Dipolar Liquids." Adolf Schallamach. Publication No. 95. 12 pages. Dielectric constants and loss factor *versus* temperature curves were determined for a number of binary mixtures of polar liquids. From the results it was deduced that dielectric relaxation involves a volume containing more than one molecule, and that mixtures of a non-associated and an associated liquid are unhomogeneous on the microscopic scale.

"Specon Variable Speed Transmissions with Infinite Speed Range." Speed Control Corp., Wickliffe, O. 6 pages. The company's Specon MD speed transmissions are described and illustrated, and data on specifications, speed and torque ratings, and proper selection of transmissions also appear.

"**A.S.T.M. Standards on Textile Materials** (With Related Information)." October, 1948. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. Paper, 9 by 6 inches, 560 pages. Price, $4.35. This edition includes in their latest form 86 specifications, test methods, and tolerance standards developed by A.S.T.M. Committee D-13 on Textile Materials. Of the standards 26 cover cotton, 10 cover rayon and silk, 11 pertain to wool, six are on asbestos, six concern glass, and four cover the bast and leaf fibers. The remaining standards are general testing methods, definitions, etc. Many valuable property and conversion tables are appended.

"**Electrical Engineering Problems in the Rubber and Plastics Industries.**" October, 1948. American Institute of Electrical Engineers, 33 W. 39th St., New York 18, N. Y. 54 pages. Price: $1.50 to members; $3 to non-members. This booklet contains the following papers presented at the AIEE Conference of Electrical Engineering Problems in the Rubber and Plastics Industries on April 20 at Akron, O.: "Electric Power Distribution Systems for Small Rubber and Plastics Plants," H. J. Finison, B. D. Morgan, and R. S. Ferguson; "Spot Conversion for Adjustable Speed Drives in Rubber and Plastics Manufacturing Plants," C. E. Robinson; "Separate Electrical Equipment Rooms *Versus* NEMA Enclosures for Protection of Motors and Controls," F. A. Green; "Electric Braking for Rubber Mills and Calenders," B. J. Dalton; "Electric Drive Characteristics for Rubber Processing Machines," A. T. Bacheler; "The Measurement and Control of Tension and Its Relation to Motor Input," H. L. Smith; and "Temperature Measurement and Control on the Electrically Heated Molding Processes for Rubber and Plastics," F. L. Spangler.

"**Green Book 1948-49 Buyers Directory.**" Schnell Publishing Co., Inc., 59 John St., New York 7, N. Y. 1,448 pages. This new edition of the Green Book shows continued growth and has 56 pages more than the previous issue. As in the past, the subject matter is divided into four parts: chemicals and related materials; equipment and operating suppliers; technical and commercial services; and addresses of suppliers.

"**Effect of Simulated Service Conditions on Plastics during Accelerated and Two-Year Weathering Tests.**" W. A. Crouse, D. C. Caudill, F. W. Reinhart, National Advisory Committee, Aeronautics, Tech. Note. No. 1438 (1948). 8 pages. "**Johnstone Score Cut Slitter Wheel Grinder.**" Johnstone Engineering & Machine Co., Parkesburg, Pa. 2 pages. "**Tensile & Compressive Properties of Laminated Plastics at High and Low Temperatures.**" J. J. Lamb, I. Albrecht, National Advisory Committee, Aeronautics, Tech. Note No. 1550 (1948). 57 pages. "**New Directions in Sales Management Marketing and Packaging.** A Checklist of Significant AMA Publications." American Management Association, 330 W. 42nd St., New York 18, N. Y. 8 pages. "**Lists of Inspected Appliances Relating to Accident Hazard, Automotive Equipment Burglary Protection.**" Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago 11, Ill. 95 pages. "**Converse 1948 Basketball Yearbook.**" Converse Rubber Co., Malden 48, Mass. 54 pages. "**Football as the Champions Play It.**" Harry Rice, Pennsylvania Rubber Co., Jeannette, Pa., 32 pages.

"Indulin, Lignin from Pine Wood." Bulletin L-5. West Virginia Pulp & Paper Co., New York 17, N. Y. 30 pages. This bulletin covers sources of Indulin, chemistry of Indulin and its derivatives, typical analysis of Indulin A and C, aqueous solutions, and solubilities in single and two component mixtures of organic solvents. The second part of the booklet is a bibliography of uses for Indulin classified according to application.

BIBLIOGRAPHY

Natural, Thermal and Biochemical Degradation of Ammoniated *Hevea* Latex to Give Heat Sensitivity. F. Lepetit, *Trans. Inst. Rubber Ind.*, Aug., 1947, p. 104.

Latex Patents. W. H. Stevens, *Trans. Inst. Rubber Ind.*, Aug., 1947, p. 118.

Establishment of the Most Favorable Equilibrium Conditions between Plastic and Elastic Components of Butadiene Rubber. E. Teischinger, *Reichsamt Wirtschaftsausbau, Chem. Ber.*, Prüf-Nr. 015, 930 (1942).

The Utilization of Butadiene Rubbers in Greater Germany and in Europe. J. Eckell, *Reichsamt Wirtschaftsausbau, Chem. Ber.*, Prüf-Nr. 015, 891 (1942).

Polymerization and Depolymerization. I. Y. M. Slobodin, N. I. Matusevich, *J. Gen. Chem. (U.S.S.R.)*, 16, 2077 (1946). **II.** Y. M. Slobodin, F. Y. Rachinskii, *Ibid.*, 17, 374 (1947).

Experiments with the Juice Which Supplies Gum Elastic, Presented in 1790 before the Agricultural Society of Paris, by A. Fourcroy. *Rev. gén. caoutchouc*, Sept. 1947, p. 316.

The Malayan Rubber Industry. E. M. McColm, *Chem. Eng. News*, Dec. 22, 1947, p. 3792; Dec. 29, p. 3852.

Preparation of High-Molecular-Weight Addition Polymers. A. I. Goldberg, *Ind. Eng. Chem.*, Dec., 1947, p. 1570.

Mechanism and Theory of Vulcanization. R. D. Stiehler, J. H. Wakelin, *Ind. Eng. Chem.*, Dec., 1947, p. 1647.

Polymers and Viscosity Index. H. C. Evans, D. W. Young, *Ind. Eng. Chem.*, Dec., 1947, p. 1676.

Historical Reminiscences. H. P. Stevens, *India Rubber J.*, Dec. 13, 1947, p. 1; Dec. 20, p. 1; Dec. 27, p. 1; Jan. 3, 1948, p. 1.

Determination of Vinyl Ethers and Acetals and of Any Alcohol, Acetaldehyde, and Water Contained therein. S. Siggia, *Anal. Chem.*, Dec., 1947, p. 1025.

Polymerization of Vinyls. M. Sittenfield, *Chem. Eng.*, Dec., 1947, p. 129.

The Development and Availability of Experimental and General-Purpose GR-S Polymers. R. E. Harmon, *Rubber Age (N. Y.)*, Dec., 1947, p. 291.

Measurement of the Slipperiness of Walkway Surfaces. *Rubber Age (N. Y.)*, Dec., 1947, p. 296.

Coumarone-Indene Resins in Rubber Compounding. T. A. Bulifant, *Rubber Age (N. Y.)*, Dec., 1947, p. 300.

The Structure of a Mixed Polymer of Butadiene and Acrylonitrile. E. N. Alekseeva, *Rubber Chem. Tech.*, Oct., 1947, p. 927.

Helping the Nation on Its Feet. *Oilways*, Jan., 1948, p. 1.

Making America . . . . with Man-Made Rubber. *Oilways*, Jan., 1948, p. 14.

The Arrival of Polystyrene. J. R. Turnbull, *Scientific American*, Feb., 1948, p. 63.

Vulcanization of Chlorine-Containing Acrylic Elastomers. W. C. Mast, C. H. Fisher, *Ind. Eng. Chem.*, Jan., 1948, p. 107.

Permeation through and Sorption of Water vapor by High Polymers. P. M. Hauser, A. D. McLaren, *Ind. Eng. Chem.*, Jan., 1948, p. 112.

Hysteresis, Elastic Modulus, and Growth of Tire Cords under Comparable Loads. E. Honold, H. Wakeham, *Ind. Eng. Chem.*, Jan., 1948, p. 131.

Degradation of Rayon Tire Yarn at Elevated Temperatures. R. C. Waller, K. C. Bass, W. E. Roseveare, *Ind. Eng. Chem.*, Jan., 1948, p. 138.

Compounding Pure Gum GR-S Stocks. Effect of Inorganic Oxides and Oxidizing Agents. H. L. Fisher, A. R. Davis, *Ind. Eng. Chem.*, Jan., 1948, p. 143.

Solution Viscosity of GR-S. W. A. Schulze, W. W. Crouch, *Ind. Eng. Chem.*, Jan., 1948, p. 151.

The Absorption of Energy by Rubber. I. L. Mullins, *J. Rubber Research*, 16, 180 (1947).

Determination of Resistance to Abrasive Wear. III. H. A. Daynes, J. R. Scott, *J. Rubber Research*, 16, 123 1947. **IV.** J. R. Scott, *Ibid.*, 125. **V.** R. W. Parris, J. R. Scott, *Ibid.*, 127. **VI-VII.** J. F. Morley, J. R. Scott, *Ibid.*, 129. **VIII.** J. F. Morley, *Ibid.*, 17, 61 (1948). **IX.** J. R. Scott, *Ibid.*, 64. **X.** R. G. Newton, J. R. Scott, *Ibid.*, 64. **XI.** R. G. Newton, J. R. Scott, W. H. Willott, Ibid., 69. **XII.** J. R. Scott, Ibid., 75.

Market Reviews

CRUDE RUBBER

Commodity Exchange

WEEK-END CLOSING PRICES

	Sept. 25	Oct. 30	Nov. 6	Nov 13	Nov. 20	Nov. 27
Standard Contract:						
Dec.	21.25	20.85	20.55	20.25	19.70	18.91
1949:						
Feb.	21.22	20.72	20.35	19.92	19.18	18.57
Apr.	21.19	20.55	20.25	19.67	18.86	18.35
June	21.13	20.40	20.20	19.55	18.75	18.25
Aug.	21.03	20.30	20.10	19.45	18.65	18.15
Oct.	20.93	20.20	20.00	19.35	18.55	18.05
Dec.	....	20.10	19.90	19.25	18.45	17.95
Weekly sales vol., tons	1,140	2,220	1,790	1,120	2,700	1,410
No. 1 Contract:						
1949						
Mar.	....	21.15	20.40	19.90	19.00	18.60
May	....	21.00	20.40	19.90	18.92	18.43
July	....	20.80	20.30	19.60	18.75	18.30
Sept.	....	20.60	20.20	19.50	18.65	18.15
Nov.	....	20.50	20.10	19.40	18.55	18.05
1950						
Jan.	....	20.40	20.00	19.30	18.45	17.95
Weekly sales vol., tons	....	1,110	2,890	1,560	3,750	1,970
Total sales vol., tons	1,140	3,330	4,680	2,680	6,450	3,380

DESPITE the dock strike which served to brake the decline, rubber futures on the Commodity Exchange last month continued the downward movement that began in mid-October. The price trend can be traced directly to the unexpectedly high rubber production in the Far East in the past few months, coupled with tapering consumption in this country. Volume of trade on the Exchange showed a pick-up after the marked dullness of the past few months, with a total of 21,370 tons being traded during November. Much of this activity was professional in nature and consisted of switching and short covering. For the first time since its establishment, the No. 1 contract showed greater activity than the standard contract, with sales volumes being 13,110 tons and 8,260 tons, respectively.

Adding to the depressing effect of Far Eastern reports of increased rubber production was the report that Russia did not make any further purchases in November and does not intend to make any in December. At the current monthly rate of Far East rubber shipments to Russia, this non-buying would indicate an extra supply of approximately 35,000 tons in the last two months of this year. Malaya thus having completed shipment of its obligations to Russia is now believed to be shipping to European markets.

This Malayan rubber shipping began to have an effect on the Ceylon market late in November. Although Ceylon crepe is of fine quality, its production costs are higher, and competition from Malaya sent Ceylon prices tumbling down. The dwindling price of Ceylon rubber has caused trade circles to observe that United States Government releases to civilian consumers from the strategic stockpile have resulted in decreased American demand for Ceylon rubber. It was reliably reported that the Ceylon Government has rejected the Soviet's offer to buy the bulk of its 1949 production. The same source also reported that contrary to rumors the United States and British governments have not as yet made any definite offer to purchase Ceylon's rubber in bulk.

January rubber futures prices on the standard contract opened at the monthly high of 20.46¢ on November 1 and fell irregularly thereafter to close the month at 17.00¢. Similar downward trends were shown by other futures in both the standard and No. 1 contracts. In the latter contract, March futures opened the month at 20.50¢, hit a peak of 20.75¢ on November 4 in a short-lived flurry of activity, then fell and ended the month at 17.50¢.

New York Outside Market

WEEK-END CLOSING PRICES

	Sept. 25	Oct. 30	Nov. 6	Nov. 13	Nov. 20	Nov. 27
No. 1 R.S.S.:						
Nov.	22.38	21.38	20.63	20.25	19.50	19.00
Dec.	22.38	21.38	20.63	20.25	19.50	19.00
Jan.-Mar.	22.25	21.25	20.63	20.13	19.25	18.75
Apr.-June	22.00	21.25	20.50	20.00	19.13	18.63
July-Sept.	.	.	. .	. .	19.00	18.50
No. 3 R.S.S.	20.75	20.25	19.50	19.25	18.50	18.00
No. 2 Brown	16.50	15.50	15.25	14.75	14.50	14.25
Flat Bark	11.38	11.50	11.25	11.00	11.25	11.50

THE factors influencing the downward trend of the rubber futures market were also much in evidence on the New York Outside Market last month. Prices fell steadily, although the dock strike served to cushion the fall of spot prices in view of declining warehouse stocks. Midway during the month premiums on warehouse stocks of physical rubber began to appear, which increased slowly and went over 2¢ a pound later in the month, although not reflected in quoted prices on the market.

The spot price for No. 1 ribbed smoked sheet began at the monthly high of 21.38¢ on November 1, then fell irregularly during the remainder of the month to close at 17.88¢. In the lower grades, No. 3 R.S.S. began the month at 19.75¢ and closed at 17.00¢; No. 2 Brown went from 15.50 on November 1 to 13.88¢ on November 30; and Flat Bark fluctuated between 11.00¢ and 11.50¢ during the month.

Latices

CONSUMPTION of *Hevea* latex has now risen above the 2,000-ton a month level, and indications are that it will continue at this level and probably increase even further early next year, according to Arthur Nolan, Latex Distributors, Inc., writing in Lockwood's November *Rubber Report*. Mr. Nolan gives estimated September imports of *Hevea* latex as 1,438 long tons, dry weight; consumption, 2,234 long tons; and month-end stocks, 10,777 long tons. For the first nine months of 1948, *Hevea* latex imports are estimated at 24,815 long tons; while consumption is figured at 18,386 long tons. Bulk prices for *Hevea* latex have risen from 27.75-28.25¢ a pound to 27.75-29.75¢. Stocks of *Hevea* latex are still abnormally large, but should show a gradual reduction in view of the increased demand.

October production of GR-S latex is also estimated by Mr. Nolan at 1,462 long tons, dry weight. Stocks of GR-S latex in the hands of industry are estimated to be about 30-40 days' supply, a small supply, but probably adequate for current production rates. Stocks of Neoprene latex appear at about one month's supply, with monthly consumption estimated at 250-350 tons. There were no changes in prices of GR-S and neoprene latices last month.

Fixed Government Prices*

Guayule

Guayule *(carload lots)*	$0.17½

Latex†

GR-S, Type 2 *(tank car lots)*	.18½‡
(Carload, drums)	.268
(Less carload, drums)	.273
Types 3 and 4 *(tank car lots)*	.18½‡
(Carload, drums)	.26
(Less carload, drums)	.26½
Type 5 *(tank car lots)*	.20¼‡
(Carload, drums)	.27¾
(Less carload, drums)	.27¾

Plantation Grades

No. 1X Ribbed Smoked Sheets	.23
1X Thick Pale Latex Crepe	.29
1 Thick Pale Latex Crepe	.29
2 Thick Pale Latex Crepe	.28½
3 Thick Pale Latex Crepe	28¾
1X Thin Pale Latex Crepe	.29
1 Thin Pale Latex Crepe	.29
2 Thin Pale Latex Crepe	.28½
3 Thin Pale Latex Crepe	.28¼
Liberian A	.28⅝
AA	.29
RCMA Watermarked Crepe No. 16	.37⅞
17	.32⅜
18	.30⅞
Sole Crepe Trimmings	.28½
No. 1X Thin Pale Latex Crepe Trimmings	.28½
1X Brown Crepe	.21⅞
2X Brown Crepe	.21⅝
2 Remilled Blankets (Amber)	.21¾
3 Remilled Blankets (Amber)	.21⅝
Rolled Brown	.185

Synthetic Rubber

GR-M (Neoprene GN)	.32
GR-M-10 (Neoprene GN-A)	.32
GR-S (Buna S)	.18½
GR-I (Butyl)	.18½

Wild Rubber

Upriver Coarse (crude)	.12⅝
(Washed and dried)	.20¼
Islands Fine (crude)	.14⅝
(Washed and dried)	.22½
Caucho Ball (crude)	.11⅝
(Washed and dried)	.19½
Mangabiera (crude)	.08½
(Washed and dried)	.18

* For a complete list of all grades of dry rubbers see Rubber Reserve Co. General Sales and Distribution Circular, July 1, 1945, as amended.
† Prices per pound total solids.
§ Plus average freight charge of 0.75¢ per pound dry weight.

RECLAIMED RUBBER

DEMAND for reclaimed rubber fell off slightly during November, but was still at high levels. A high rate of production prevailed, and exports of reclaim continued to show the slight improvement evident in October. In general, the industry is adopting a cautious attitude and waiting for further developments in the declining crude rubber market to determine its effect on the reclaim market.

Final August and preliminary September statistics on the domestic reclaimed rubber industry are now available. Production of reclaim during August totaled 20,255 long tons; consumption, 22,917 long tons; exports, 643 long tons; and month-end stocks, 32,025 long tons. Preliminary figures for September show a production of 21,790 long tons; consumption, 24,115 long tons; exports, 740 long tons; and end-of-month stocks, 30,363 long tons.

There were no changes in reclaim rubber

prices during November, and current prices are listed below:

Reclaimed Rubber Prices

	Sp. Gr.	¢ per Lb.
Whole tire	1.18-1.20	8.5 / 9
Peel	1.18-1.20	8.5 / 9.5
Inner tube		
Black	1.20-1.22	12.75/13.75
Red	1.20-1.22	14 /14.5
GR-S	1.18-1.20	9.5 /10
Butyl	1.16-1.18	8.5 / 9
Shoe	1.50-1.52	8.25/ 8.75

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

RAYON

SECOND-quarter 1948 production of tire cord and fabric amounted to 139,000,000 pounds, 7% below the first-quarter figure. Of this total, 43%, or 60,000,000 pounds, were rayon and nylon; the balance was cotton tire cord and fabric. Third-quarter shipments of rayon and nylon yarn to the tire industry totaled 64,800,000 pounds, an increase of approximately 8% over the second quarter.

Total October domestic rayon shipments hit 94,400,000 pounds, 3% above the September level, and included 71,900,000 pounds of rayon filament yarn. These yarn shipments consisted of 46,300,000 pounds of viscose and cupra and 25,600,000 pounds of acetate. Total rayon filament yarn stocks held by producers at the end of October amounted to 10,100,000 pounds, of which 3,200,000 pounds were acetate and the remainder viscose and cupra. Domestic deliveries of rayon for the first 10 months of this year totaled 913,700,000 pounds, 16.5% above shipments in the corresponding 1947 period.

No changes occurred in rayon tire yarn and fabric prices during November, and current prices are listed below:

Rayon Fabrics

Tire Yarns		
1100/480	$0.55 /	$0.56
1100/490	.57	
1150/490	.57	
1650/720	.54 /	.56
1650/980	.56	
1900/980	.56	
2200/960	.55	
2200/980	.55	
Tire Fabrics		
1100/490/2	.71	
1650/980/2	.685 /	.70
2200/980/2	.67	

SCRAP RUBBER

DOMESTIC movement of scrap rubber tires and tubes continued sluggish during November, and dealers state that the outlook for the remainder of the year is far from bright. Foreign shipments are also slow because of restrictions and dollar shortages abroad, particularly in Spain, Germany, and Italy, which have all indicated a desire to increase their purchases of scrap rubber from this country.

No purchases of scrap rubber, however, were made here in November by the Japanese Board of Trade, but a purchase was tentatively scheduled for December. It was revealed that the last Japanese purchase, made in September, was at lower prices than the preceding August purchase. The September purchase included 800 tons of No. 1 peelings at $75 per net ton; 400 tons of No. 2 peelings at $57.50 per net ton; 200 tons of red natural tubes at 8.5¢ per pound; 700 tons of black natural tubes at 6⅞¢ per pound; 700 tons of mixed tubes at 6.75¢ per pound; 700 tons of GR-S tubes at 3.75¢ per pound; and 400 tons of uncured tire friction material at 4¢ per pound. Dealers report that the Japanese require scrap rubber to be packed in open wire bound bales or gunny sacks not exceeding 300 gross pounds because they lack facilities to handle larger bales. This small bale, however, entails an almost prohibitive labor cost here and has also aroused much criticism.

As for scrap price changes during November, mixed auto tires rose from $12.50 to $13.00 per net ton at Akron, although remaining at $11.50 in the East. Mixed auto tubes dropped from 4.00¢ to 3.50¢ per pound in the East; while black passenger tubes fell from 5.00¢ to 4.50¢ per pound at Akron and from 4.50¢ to 4.00¢ per pound in the East. Following are dealers' buying prices for scrap rubber, in carload lots, delivered to mills at points indicated:

	Eastern Points	Akron, O.
	(Per Net Ton)	
Mixed auto tires	$11.50	$13.00
S-A. G passenger (natural)	nom.	nom.
Truck (natural)	nom.	nom.
Peelings (natural), No. 1	50.00	50.00
2	31.00	31.00
3	29.00	29.00
	(¢ per Lb.)	
Mixed auto tubes	3.50	4.00
Red passenger tubes	7.00	7.00
Black passenger tubes	4.00	4.50
Truck tubes	4.00	4.75
Mixed puncture-proof tubes	0.50	0.50
Air brake hose	nom.	nom.

COTTON AND FABRICS

New York Cotton Exchange Week-End Closing Price

Futures	Sept. 25	Oct. 30	Nov. 6	Nov. 13	Nov. 20	Nov. 27
Dec.	30.89	31.02	31.31	31.63	31.82	31.86
1949						
Mar.	30.64	31.02	31.34	31.60	31.88	31.84
May	30.41	30.76	31.20	31.49	31.69	31.63
July	29.67	29.57	30.27	30.52	30.84	30.77
Oct.	27.68	27.32	28.35	28.68	28.72	28.59
Dec.	27.53	27.09	28.13	28.49	28.52	28.39

COTTON futures prices moved upward on the New York Cotton Exchange during November in a market that was firmer and more active than in the few preceding months. Much of the activity was in the nature of professional covering since most traders had been short prior to the election. In addition most mills appeared to have overstayed a bear market in hopes of getting lower prices and were now actively engaged in making purchases. Heavy foreign fixations also had an effect in sending prices up. Initial impetus to the market came from the elections since the trade believes that a Democratic Congress can be expected to keep the loan rate of 90% of parity. The rise was bolstered later in the month by the ECA announcement that enough funds had been allocated to cover the purchase of more than 300,000 bales of cotton for England and Western Germany as the first part of the approximately 2,500,000 bales the agency has scheduled for purchase.

As for actual price movements, the 15/16-inch middling spot price began the month at 31.59¢, and rose to a peak of 32.71¢ on November 30. March futures started at 31.05¢ on November 1, and ended the month at the high of 32.23¢.

Fabrics

In the face of reduced production of osnaburgs, demand for these constructions rose in November owing to their use as substitutes for burlap in the bag trade. A great deal of first-quarter production has already been sold, with lighter weight constructions dominating sales. In drills and twills, the most significant trading was done in awning drills, with most other constructions, particularly the three-leaf types, quite stagnant.

As for sheetings, it is estimated that about 60% of first-quarter production has been sold thus far and more than 90% of fourth-quarter production committed for delivery. The bag trade showed renewed interest in Class B constructions for first-quarter delivery, and Class C sheetings were also moving actively for December and January delivery. The price trend in print cloths was quite strong last month, and there were some predictions of 0.25¢ price rises in some constructions for near-by delivery.

Pigment Dispersions

A NEW line of plastic pigment dispersions for the vinyl plastics industry, offering the claimed advantages of excellent uniformity, extremely fine grind, and great ease of handling, has been announced by the plastic products division of Schiefer-Eldridge Printing Ink Corp., Brooklyn 1, N. Y. The new materials consist of highly concentrated dispersions in plasticizers of tested colorants which have proved themselves in plant use as the best of their type for polyvinyl chloride plastics. The development represents a new technique in successfully utilizing monomeric plasticizers, such as dioctyl phthalate, as a dispersing medium for vinyl colorants and gives outstanding results with a number of the less readily dispersed materials, such as phthalocyanine blue and green, pigment scarlet "Z," lithol rubines, special maroons, and carbon blacks. Of particular interest are the carbon black dispersions which, despite their high concentration, possess unusual softness and flow properties that make them clean and easy to handle in the plant.

In calendering operations the plastic pigment dispersions are most readily added in the preliminary hot mixing cycles. For Banbury use the dispersions are added after the actual fluxing operation has begun, to forestall adhesion to the sides; while in hot mill mixing it is most suitable to allow the plastic batch to flux and form a band before the dispersion is added to the rolling bank. In the dry mixing process for extrusion compounds, such as the Hungerford tumbler process, the dispersions can be added to the dry resin in the mixer. For organisols, the dispersions are added by simple mechanical stirring. In all cases the color will rapidly disperse and diffuse throughout the plastic bath, giving maximum uniformity and the full tinting strength of the pigment used, it is further claimed.

COMPOUNDING INGREDIENTS

Current Quotations*

Abrasives

Pumicestone, powdered	lb.	$0.03¾	$0.0425
Rottenstone, domestic	ton	36.00	43.00

Accelerators, Organic

A-10	lb.	.40	.47
A-19	lb.	.52	.58
A-32	lb.	.59	.69
A-77	lb.	.42	.55
A-100	lb.	.42	.55
Accelerator 8	lb.	.75	
49	lb.	.44	.45
552	lb.	1.63	
808	lb.	.59	.61
833	lb.	1.13	1.15
Acrin	lb.	.65	
Advan	lb.	.55	
Aero AC 50	lb.	.50	.56
165	lb.	.37	.39
Altax	lb.	.35	.445
Antox	lb.	.54	.56
Arazate	lb.	2.16	
Beutene	lb.	.59	.64
B-J-F	lb.	.27	.32
Butasan	lb.	1.00	
Butazate	lb.	1.00	
Butyl Eight	lb.	1.00	1.05
Zimate	lb.	1.00	
Captax	lb.	.27	.345
C-P-B	lb.	1.95	
Cumate	lb.	1.45	
Cuprax	lb.	.60	.62
Diesterex N	lb.	.50	.57
DOTG (diorthotolylguanidine)	lb.	.44	.50
DPG (diphenylguanidine)	lb.	.39	.45
El-Sixty	lb.	.39	.46
Ethasan	lb.	1.00	
Ethazate	lb.	1.00	
Ethyl Thiurad	lb.	1.00	
Tuads	lb.	1.00	
Tuex	lb.	1.00	
Zimate	lb.	1.00	
Ethylidine aniline	lb.	.42	.43
Formaniline	lb.	.36	.37
Good-Rite Erie	lb.	.53	.55
Hepteen	lb.	.42	.48
Base	lb.	1.80	1.90
Ledate	lb.	1.00	
M-B-T	lb.	.27	.33
M-B-T-S	lb.	.35	.41
Mertax	lb.	.37	1.44
Methasan	lb.	1.00	
Methazate	lb.	1.00	
Methyl Selenac	lb.	1.60	
Tuads	lb.	1.10	
Zimate	lb.	1.00	
Monex	lb.	1.10	
Mono-Thiurad	lb.	1.10	
Morfex 33	lb.	.53	.58
O-X-A-F	lb.	.34	.39
Pentex	lb.	.74	.84
Flour	lb.	.1225	.1325
Permalux	lb.	1.18	1.20
Phenex	lb.	.40	.45
Pipazate	lb.	1.53	
Polyac	lb.	1.40	
Rotax	lb.	.39	.42
S. A. 52	lb.	1.10	
57, 62, 67, 77	lb.	1.00	
66	lb.	1.45	
Safex	lb.	1.15	
Santocure	lb.	.53	.60
Selazate	lb.	1.45	
Selenac	lb.	1.45	
SPDX-GH	lb.	.64	.69
Tellurac	lb.	1.45	
Tetrone	lb.	1.25	
A	lb.	1.85	
Thiocarbanilide	lb.	.34	.39
Thiofide	lb.	.35	.42
Thionex	lb.	1.10	
Thiotax	lb.	.27	.34
Thiurad	lb.	1.10	
Thiuram E	lb.	1.00	
M	lb.	1.10	
Trimene	lb.	.54	.64
Base	lb.	1.03	1.18
Triphenylguanidine(TPG)	lb.	.45	.50
Tuex	lb.	1.10	
2-MT	lb.	.58	.60
Ultex	lb.	1.00	1.05
Ureka	lb.	.55	.62
Blend B	lb.	.55	.62
C	lb.	.52	.59
Vulcanex	lb.	.45	
Z-B-X	lb.	2.45	
Zenite	lb.	.33	.35
A	lb.	.42	.44
B	lb.	.39	.41
Special	lb.	.34	.36

Accelerator-Activators, Inorganic

Lime hydrated	ton	8.00	12.25
Litharge, comml	lb.	.2325	.245
Eagle, sublimed	lb.	.2425	.2435
Red lead, comml.	lb.	.2425	.2575
Eagle	lb.	.2525	
White lead, basic	lb.	.221	.231
Eagle	lb.	.221	.231
White lead, silicate	lb.	$0.1925	$0.2635
Eagle	lb.	.233	.2635
Zinc oxide, comml.†	lb.	.11	.17

Accelerator-Activators, Organic

Barak	lb.	.60	
D-B-A	lb.	1.95	
Delac P	lb.	.45	.52
Emery's 0-18 Elaine	lb.	.255	.375
S-24	lb.	.34	.43
Guantal	lb.	.47	.54
Laurex	lb.	.32	.35
Lead oleate	lb.	.33	
MODX	lb.	.295	.345
Palmalene	lb.	.35	
Plastone	lb.	.27	.30
Ridacto	lb.	.22	.24
Seedine	lb.	.1485	.1705
Stearex Beads	lb.	.14⅞	.15⅞
Stearic acid, single pressed	lb.	.24	.25
Double pressed	lb.	.245	.255
Triple pressed	lb.	.2725	.285
Stearite	lb.	.14⅞	
Tonox	lb.	.50	.59
Zinc stearate	lb.	.42	.43

Alkalies

Caustic soda, flake	100 lbs.	3.45	6.90
Liquid, 50%	100 lbs.	2.40	2.50
Solid	100 lbs.	3.05	5.60

Antioxidants

AgeRite Alba	lb.	2.20	2.30
Gel	lb.	.58	.60
H.P.	lb.	.61	.63
Hipar	lb.	.82	.84
Powder	lb.	.46	.48
Resin	lb.	.63	.65
D	lb.	.46	.48
Stalite	lb.	.46	.48
White	lb.	1.40	1.50
Akroflex C	lb.	.58	.60
Albasan	lb.	.69	.74
Aminox	lb.	.46	.55
Antisol	lb.	.23	.24
Antox	lb.	.54	.56
Aranox	lb.	2.15	
Betanox Special	lb.	.68	.77
B-L-E	lb.	.46	.55
Powder	lb.	.61	.70
B-X-A	lb.	.43	.52
Copper Inhibiter X-872-L	lb.	1.75	1.85
Deenex	lb.	.95	1.05
Flectol H	lb.	.46	.53
Flexamine	lb.	.61	.70
Heliozone	lb.	.25	.26
Mekon micro-crystalline wax, amber	lb.	.14	.16
Black	lb.	.135	.155
Yellow	lb.	.155	.175
Neozone (standard)	lb.	.66	.68
A	lb.	.43	.45
C	lb.	.47	.49
D	lb.	.43	.45
Distilled	lb.	.48	.50
Parazone	lb.	.68	
Perflectol	lb.	.61	.68
Permalux	lb.	1.53	1.55
Rio Resin	lb.	.50	.52
Santoflex 35	lb.	.61	.68
B	lb.	.46	.53
Santovar-O	lb.	1.10	1.17
Santowhite Crystals	lb.	1.73	1.80
MK	lb.	1.40	1.52
MKS	lb.	1.25	1.37
S.C.R.	lb.	.32	.34
Solux	lb.	1.93	1.95
Stabilite	lb.	.48	.50
Alba	lb.	.69	.74
L	lb.	.48	.50
Sunproof	lb.	.25	.30
Improved	lb.	.25	.30
Jr.	lb.	.18	.23
Thermoflex	lb.	1.48	1.50
A	lb.	.76	.78
C	lb.	.54	.56
Tonox	lb.	.50	.59
Tysonite	lb.	.215	.2225
V-G-B	lb.	.55	.64
Zenite	lb.	.37	.39

Antiseptics

Copper naphthenate, 6-8%	lb.	.2275	.2325
G-4	lb.	1.15	2.70
G-11	lb.	3.50	
Pentachlorophenol	lb.	.20	.25
Resorcinol, technical	lb.	.68	
Zine naphthenate, 8-10%	lb.	.215	.2675

Blowing Agents

Ammonium, bicarbonate	lb.	.064	.0975
Carbonate	lb.	.165	.18
Sodium bicarbonate	100 lbs.	1.95	3.00
Carbonate, technical	100 lbs.	1.15	4.45
Sponge Paste	lb.	.20	
Unicel	lb.	.60	
ND	lb.	1.00	

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of all known ingredients. Prices are not guaranteed; contact suppliers for spot prices.

†For trade names, see Color—White, Zinc Oxide.

Bonding Agents

MDI	lb.	$7.25	$7.75
50	lb.	3.60	3.85
Ty-Ply Q. S.	gal.	6.75	8.00

Brake Lining Saturants

B.R.T. No. 3	lb.	.0175	.0185
Resinex L-5	lb.	.0225	.03

Carbon Blacks

Conductive Channel—CC

Continental R-20, -40	lb.	.055	.102
Kosmos/Dixie	lb.	.15	.185
Spheron C	lb.	.12	.165
I	lb.	.10	.145
N	lb.	.22	.25
Voltex	lb.	.15	.185

Easy Processing Channel—EPC

Continental AA	lb.	.055	.102
Kosmobile 77/Dixiedensed 77	lb.	.07	.1125
Micronex W-6	lb.	.07	.1125
Spheron #9	lb.	.07	.117
Witco #12	lb.	.055	.102
Wyex	lb.	.07	.115

Hard Processing Channel—HPC

Continental F	lb.	.055	.102
HX	lb.	.07	.115
Kosmobile S/Dixiedensed S	lb.	.07	.1125
Micronex Mk. II	lb.	.07	.1125
Spheron #4	lb.	.07	.117
Witco #6	lb.	.555	.102

Medium Processing Channel—MPC

Arrow TX	lb.	.07	.115
Continental A	lb.	.055	.102
Kosmobile S-66 Dixiedensed S-66	lb.	.07	.1125
Micronex Standard	lb.	.07	.1125
Spheron #6	lb.	.07	.117
Witco #1	lb.	.055	.102

Conductive Furnace—CF

Statex A	lb.	.08	.10
Sterling I	lb.	.09	

Fast Extruding Furnace—FEF

Statex M	lb.	.055	.095

Fine Furnace—FF

Statex B	lb.	.0575	.0975
Sterling 99	lb.	.065	.105
105	lb.	.0732	.117
Vulcan	lb.	.0732	.117

High Abrasion Furnace—HAF

Philblack O	lb.	.07	.1132

High Elongation Furnace—HEF

Sterling K	lb.	.05	.09

High Modulus Furnace—HMF

Continex HMF	lb.	.05	.075
Kosmos 40/Dixie 40	lb.	.05	.09
Kosmos 50/Dixie 50	lb.	.055	.095
Modulex	lb.	.05	.075
Philblack A	lb.	.0525	.095
Statex 93	lb.	.05	.09
Sterling L	lb.	.05	.09
SO	lb.	.055	.095

Reinforcing Furnace—RF

Kosmos 60/Dixie 60	lb.	.0732	.115

Semi-Reinforcing Furnace—SRF

Continex SRF	lb.	.035	.055
Essex	lb.	.035	.055
Furnex	lb.	.035	.075
Gastex	lb.	.035	.075
Kosmos 20/Dixie 20	lb.	.035	.075
Pelletex	lb.	.035	.075
Sterling NS, R, S	lb.	.035	.075

Very Fine Furnace—VFF

Statex K	lb.	.0732	.1125

Fine Thermal—FT

P-33	lb.	.05	

Medium Thermal—MT

Thermax	lb.	.03	
Stainless	lb.	.035	

Chemical Stabilizers

Lead stearate	lb.	.46	.48
Vanstay	lb.	.38	.40
White lead, basic	lb.	.221	.231

Colors

Black

Black Paste #25	lb.	.22	.40
BK Iron Oxides	lb.	.03	.11
Lampblack, comml.	lb.	.07	.30
Superjet	lb.	.0675	.1025
Mapico	lb.	.1075	.11
MB Mineral Blacks	lb.	.0315	.0675

Blue

Du Pont	lb.	.945	3.95
Heveatex pastes	lb.	.80	1.45

Stan-Tone	lb.	$1.00	$1.35
Toners	lb.	.30	3.50

Brown

Brown Paste #5, #10	lb.	.35	.45
Iron oxide, brown	lb.	.03	.12
Mapico	lb.	.125	
Metallic brown	lb.	.03	.0325
Plastics brown	lb.	.0565	.065
Sienna, burnt	lb.	.0375	.15
Raw	lb.	.04	.1275
Umber, burnt	lb.	.0475	.0675
Raw	lb.	.0375	.06

Green

Chrome	lb.	.12	.4675
Oxide	lb.	.33	.40
Du Pont	lb.	1.10	3.20
G-4099	lb.	.325	.33
G-5299, -6099	lb.	.315	.32
G-7599	lb.	.38	.385
G-9869	lb.	.75	.90
G-9976	lb.	.85	1.00
Heveatex pastes	lb.	.95	1.85
Stan-Tone	lb.	1.50	3.30
Toners	lb.	.35	4.00

Orange

Du Pont	lb.	2.75	3.65
Orange Paste #13	lb.	1.35	1.50
Stan-Tone	lb.	1.65	2.25
Toners	lb.	.30	1.50

Red

Antimony trisulfide	lb.	.55	.68
R. M. P. Sulfur Free	lb.	.63	.68
R.P.M. No. 3	lb.	.55	.60
Cadmium red lithopane	lb.	1.09	1.49
Cadmolith Red	lb.	1.10	1.40
Du Pont	lb.	1.15	1.90
Indian Red	lb.	.115	.1175
Iron oxide, red	lb.	.0525	.1175
Light	lb.	.115	.1175
Mapico	lb.	.115	.1175
Red Paste #17, I-2	lb.	.95	1.10
Rub-Er-Red	lb.	.0975	
Stan-Tone	lb.	1.10	3.05
Toners	lb.	.25	4.15
Tuscan Red	lb.	.245	.25
Venetian Red	lb.	.035	.049

White

Antimony oxide	lb.	.34	.37
Lithopone, titanated	lb.	.08	.0925
Cryptone BT	lb.	.08	.085
Titanium pigments:			
Rayox LW	lb.	.18	.19
R-110	lb.	.20	.21
Ti-Cal	lb.	.075	.0825
Ti-Pure	lb.	.195	.225
Titanox-A, -AA	lb.	.195	.20
RA, RA-10	lb.	.0775	.0825
RC	lb.	.215	.225
RC-HT	lb.	.075	.08
Zopaque	lb.	.175	.185
Zinc oxide, comml.	lb.	.11	.17
Azo ZZZ-11, -44, -55	lb.	.11	.12
-66	lb.	.1325	.1425
35% leaded	lb.	.12⅝	.13⅝
Eagle AAA, lead free	lb.	.135	.1375
35% leaded	lb.	.15⅛	.15⅜
50% leaded	lb.	.15⅞	.16⅛
Florence Green Seal-8	lb.	.1525	.155
Red Seal-9	lb.	.1475	.15
White Seal-7	lb.	.1575	.16
Horsehead XX-4, -78	lb.	.135	.1375
Kadox-15, -17, -72	lb.	.135	.1375
-25	lb.	.1575	.16
Protox-166	lb.	.135	.1375
St. Joe, lead free	lb.	.11	.12
Zinc sulfide, comml.	lb.	.135	.1375
Cryptone ZS-800	lb.	.135	.1375

Yellow

Cadmium yellow lithopone	lb.	.85	.90
Cadmolith Yellow	lb.	.85	.90
Chrome	lb.	.315	.335
Du Pont	lb.	1.35	1.95
Iron oxide, yellow	lb.	.01⅜	.0925
Mapico	lb.	.09	.0925
Ocher, yellow	lb.	.0125	.0275
Stan-Tone	lb.	1.00	1.55
Toners	lb.	.50	1.37
Yellow D	lb.	1.25	1.35

Dispersing Agents

Darvan Nos. 1, 2	lb.	.19	.30
Stan-Chem	lb.	.1225	.2587
Triton R-100	lb.	.12	.25

Dusting Agents

Glycerized Liquid Lubricant, concentrated	gal.	1.85	
Lubrex	lb.	.25	.30
Mica	lb.	.0675	.075
Pyrax A	ton	12.50	
W. A.	ton	14.50	
Snow Crest Talc	ton	33.00	35.00
Vanfre	gal.	2.00	2.50
Zinc stearate	lb.	.42	.43

Extenders

Advagum 1098	lb.	.42	
1198	lb.	.40	
B. R. S. 700	lb.	.0175	.026
B. R. T. No. 7	lb.	.0265	.0275
Califlux 510, 550	lb.	.025	.0325
G. P.	lb.	.0125	.02
Dielex B	lb.	.06	
Factice, Amberex	lb.	$0.337	$0.416
Brown	lb.	.153	.3335
Neophax	lb.	.19	.356
White	lb.	.144	.351
Mineral Rubbers			
Black Diamond	ton	25.00	30.00
Extender 600	lb.	.18	
Hard Hydrocarbon	ton	42.00	44.00
No. 38	ton	25.00	
Parmr	ton	21.00	29.00
Nuba No. 1, 2	lb.	.04	
No. 3X	lb.	.065	
Rubber substitute, brown	lb.	.18	.317
White	lb.	.16	.33
Synthetic 100	lb.	.41	
Vinsol Resin	lb.	.025	.035
Vistanex	lb.	.32	.36

Fillers, Inert

Asbestos fiber	ton	25.50	76.50
Barytes, floated, white	ton	35.05	49.65
Off-color, domestic	ton	19.00	20.00
No. 1	ton	33.35	47.75
2	ton	31.35	
Blanc fixe	ton	77.50	120.00
Clays:			
Champion	ton	13.00	
Crown	ton	13.00	29.50
Paragon	ton	12.50	29.00
McNamee	ton	12.50	
Stan-Tex White	ton	25.00	
Stellar-R	ton	50.00	
Suprex	ton	13.00	29.50
W-1291 English	ton	53.00	55.00
Cryptone BA, CB, MS	lb.	.08	.0825
Flocks:			
Cotton, dark	lb.	.095	.112
Dyed	lb.	.45	.85
White	lb.	.12	.20
Fabrifil X-24-G	lb.	.095	
X-24-W	lb.	.135	
Filfloc 6000	lb.	.16	
F-40-900	lb.	.105	
Kalite	ton	40.00	
Lead sulfate, basic	lb.	.2025	.2125
Lithopone, comml.	lb.	.06⅜	.0675
Albalith	lb.	.06⅝	.06⅞
Astrolith	lb.	.06⅜	.0675
Eagle	lb.	.0725	.075
Sunolith	lb.	.06⅜	.0675
Mica	lb.	.0675	.075
No. 1 Silica	ton	40.00	
Pyrax A	ton	12.50	
W. A.	ton	14.00	
Silical	ton	7.00	55.00
SL Slate Flour	ton	17.00	27.00
Suspenso	ton	22.00	
Swansdown	ton	20.00	
Terra Alba 1319	ton	27.00	
Ti-Cal	lb.	.0675	
Titanox-C, RCHT	lb.	.07	.075
Whiting, limestone	ton	11.00	27.50
Paxinosa	ton	9.50	16.50
Witco	ton	6.50	

Finishes

Black-Out	gal.	4.50	8.00
Flocks			
Cotton, dark	lb.	.095	.112
Dyed	lb.	.45	.85
White	lb.	.12	.20
Rayon, colored	lb.	.90	1.50
White	lb.	.75	1.25
Rubber lacquer, clear	gal.	1.00	2.00
Colored	gal.	2.00	3.50
Shoe varnish	gal.	1.45	
Talc	ton	14.00	32.00
Vinylum #45	lb.	1.50	1.65
Wax, Bees	lb.	.55	.73
Carnauba	lb.	.79	1.16
Montan	lb.	.33	.35
No. 118, colors	gal.	.86	1.41
Neutral	gal.	.76	1.31
Van Wax	gal.	1.25	1.30

Latex Compounding Ingredients

#6, #7, #8	lb.	.55	.60
A-2, -155	lb.	.15	.18
A-40, -41	lb.	.165	.195
A-155 TH	lb.	.16	.19
Accelerator 89	lb.	1.20	
122	lb.	1.30	
Acrysol GS, 15% solids	lb.	.145	.22
Advawet 10	lb.	.46	
Aerosol	lb.	.35	
AgeRite Dispersions	lb.	.60	2.25
Amberex Solutions	lb.	.1675	.18
Antox, dispersed	lb.	.54	
Aquablaks	lb.	.085	.165
Aquarex BBX, Conc.	lb.	.78	
D	lb.	.76	
MDL Paste	lb.	.30	
ME	lb.	.92	
NS	lb.	.60	
SMO	lb.	.50	
Areskap 50	lb.	.30	.38
100, dry	lb.	.60	.72
Aresket 240	lb.	.30	.38
300, dry	lb.	.60	.72
Aresklene 375	lb.	.42	.57
400, dry	lb.	.70	.84
Black No. 25, dispersed	lb.	.22	
Casein	lb.	.275	.37
CW-12	lb.	.85	
CW-37	lb.	.70	
Darex Copolymers Nos. 3-L, 9-L, X34-L, X44-L	lb.	.365	.50
Dispersed Sulfur No. 2	lb.	.10	.12
Ethyl Thiurad	lb.	$1.00	
Factice dispersions	lb.	.1675	$0.49
Laton L	lb.	.075	.0775
Marmix	lb.	.36	.43
Micronex, colloidal	lb.	.06	.07
NA-11	lb.	.65	
P-242	lb.	.25	.35
P-253	lb.	.15	.18
P-370	lb.	1.45	.175
P-398	lb.	2.40	
pHR Latex Chemical	lb.	2.00	
Pip-Pip	lb.	1.63	
R-2 Crystals	lb.	1.55	
Resin V	lb.	.13	
Santomerse D	lb.	.43	.65
S	lb.	.12	.25
Setsit No. 5	lb.	.75	1.00
Stablex G	lb.	.60	.70
L	lb.	.30	.40
T	gal.	.95	
Sulfur Dispersion, 50%	lb.	.07	.15
66%	lb.	.09	.17
Tepidone	lb.	.55	
Tergitol wetting agents	lb.	.265	.37
Triton R-100	lb.	.145	.25
Zinc oxide, dispersed	lb.	.13	.20

Mold Lubricants

Aluminum stearate	lb.	.38	.45
Aquarex D	lb.	.75	
MDL Paste	lb.	.32	
Carbowax compounds	lbs.	.24	.35
Colite Concentrate	gal.	.90	1.15
DC Mold Release Fluid	lb.	5.20	6.00
Emulsion No. 35	lb.	2.20	3.50
Glycerized Liquid Lubricant, concentrated	gal.	1.85	
Lubrex	lb.	.25	.30
Mica	lb.	.0675	.075
Mold Paste	lb.	.18	
Montan Wax	lb.	.57	
Para Lube	lb.	.046	.048
Rubber-Glo	gal.	.97	
Sodium stearate	lb.	.19	.24
Talc	ton	14.00	32.00

Odorants

B-3223	lb.	2.50	
Coumarin	lb.	3.00	3.15
Curodex 19	lb.	4.75	
188	lb.	5.75	
198	lb.	6.75	
GD-4440	lb.	3.50	
-5280, -5424, -53481	lb.	2.50	
-5296	lb.	1.25	
-5386	lb.	2.00	
Parador A	lb.	2.25	
C	lb.	3.25	
E	lb.	.55	
F	lb.	.47	
I	lb.	2.00	
K	lb.	.43	
Resador Nos. 1, 5	lb.	2.50	
No. 10	lb.	.40	
Rodo No. 0	lb.	4.00	4.50
No. 10	lb.	5.00	5.50
Vanillin	lb.	3.60	4.65

Plasticizers and Softeners

Akroflex C	lb.	.53	.55
Barak	lb.	.60	
Bardex	lb.	.05	.05
Bardol	lb.	.0275	.0325
B	lb.	.055	.0575
Barium stearate	lb.	.42	.4375
Bondogen	lb.	.55	.60
B. R. C. Nos. 18, 19E, 20, 22	lb.	.0125	.01
B. R. H. No. 2	lb.	.02	.0235
B. R. S. 700	lb.	.0175	.029
B. R. T. No. 4	lb.	.0265	.026
B. R. V.	lb.	.0325	.0475
Bunarax resins	lb.	.06	.129
Bunnatol G. S.	lb.	.40	.505
Butac	lb.	.11	.12
Butyl Roleate	lb.	.16	.19
Calcium stearate	lb.	.39	.415
Califlux 510, 550	lb.	.025	.03
G. P.	lb.	.0125	.0225
R-100	lb.	.05	.05
Carbonex Flakes	lb.	.0325	.0375
S Flakes	lb.	.0475	.0575
Plastic	lb.	.046	.0525
Contogums	lb.	.0875	.111
Cumar EX	lb.	.0525	
MH	lb.	.065	.11
V	lb.	.0975	.1275
Dibenzyl phthalate	lb.	.51	.5975
Sebacate	lb.	.70	.72
Dibutyl phthalate	lb.	.32	.39
Sebacate	lb.	.6275	.64
Dicapryl phthalate	lb.	.25	.3075
Dielex B	lb.	.06	
Diethyl phthalate	lb.	.32	.34
Dimethyl phthalate	lb.	.26	.28
Dipentene 122	gal.	.60	.75
Dipolymer Oil	gal.	.33	.38
Dispersing Oil No. 10	lb.	.0525	.05
Duraplex C-50 LV, 100%	lb.	.25	.295
Dutrex 6	lb.	.025	.035
Emery's 0-18 Elaine	lb.	.255	.3275
S-24	lb.	.35	.4375
Flexol Plasticizer 3GH	lb.	.55	.60
3GO	lb.	.515	.60
4GO	lb.	.36	.38
8N8	lb.	.395	.465
DOP	lb.	.379	.424
R-1	lb.	.47	.475
TOF	lb.	.45	.52
TWS	lb.	0.405	0.425

Galex W-100	lb.	$0.135	/ $0.1725
W-100D	lb.	.1325	/ .17
G. B. Light Process Oil	lb.	.025	/ .0325
Heavy Resin Oil	lb.	.015	/ .0225
Hercolyn	lb.	.1122	/ .1347
Indonex	gal.	.12	/ .17
JMH	lb.	.65	/ .68
Lead oleate	lb.	.53	
Magnesium stearate	lb.	.42	/ .44
Monoplex DBS	lb.	.6625	/ .6725
DOS	lb.	.71	/ .72
Nevillac oils	lb.	.33	/ .45
Resins	lb.	.31	/ .45
Neville 465 Resin	lb.	.0575	
R Resins	lb.	.10	/ .155
Nevinol	lb.	.17	
Nevoll	lb.	.02	/ .025
Nevtex 10	lb.	.0775	/ .08
90	lb.	.20	
No. 1-D heavy oil	lb.	.055	
Palmalene	lb.	.15	
Para Flux, regular	gal.	.1825	/ .2025
No. 2016	gal.	.22	/ .24
Para Resins 2457, 2718	lb.	.04	/ .045
Paradene Nos. 1, 2	lb.	.065	
33, 34	lb.	.07	
No. 35	lb.	.075	
Para Lube	lb.	.046	/ .048
Paraplex AL-111	lb.	.33	/ .3375
G-25	lb.	.76	/ .77
-40	lb.	.4475	/ .4575
-50	lb.	.45	/ .46
Paroils	lb.	.0975	/ .18
Pepton 22	lb.	.72	/ .75
Picco-10, -25	lb.	.12	/ .17
-75, -100	lb.	.115	/ .17
480 Oilproof resin	lb.	.15	/ .20
S. O. S.	gal.	.29	/ .34
Piccocizer 30	lb.	.055	/ .06
Piccolastic Resins	lb.	.139	/ .275
Piccolyte Resins	lb.	.15	/ .2075
Piccoumaron Resin 427-R	lb.	.12	/ .17
Resins	lb.	.06	/ .17
Piccovars	lb.	.0975	/ .1675
Piccovol	lb.	.025	/ .04
Pictar	gal.	.25	/ .30
Plasticizer 35	lb.	.205	/ .24
36	lb.	.305	/ .34
42	lb.	.34	/ .40
1889	lb.	.77	
1919	lb.	.68	
B	lb.	.35	/ .45
SC	lb.	.50	/ .57
Plastoflex No. 10	lb.	.20	
No. 20	lb.	.25	
Plastogen	lb.	.0775	/ .08
Plastone	lb.	.27	/ .30
PS-60 Resin	lb.	.35	
PT67 Light Pine Oil	gal.	.60	/ .70
101 Pine Tar Oil	gal.	.32	/ .43
400 Light Pine Tar	gal.	.345	/ .455
600 Med. Pine Tar	gal.	.345	/ .455
800 Heavy Pine Tar	gal.	.345	/ .455
R-19, R-21 Resins	lb.	.1075	
Reogen	lb.	.1175	/ .12
Resin C pitch	lb.	.02	/ .0285
R6-3	lb.	.38	/ .40
Resinex	lb.	.0325	/ .0375
L-4	lb.	.0225	/ .03
RPA No. 2	lb.	.65	
No. 3	lb.	.46	
5	lb.	.57	
RSN Flux	gal.	.10	/ .19
Rubberol Compound	lb.	.315	
S-Polymers	lb.	.44	
Santicizer B-16	lb.	.52	/ .57
E-15	lb.	.49	/ .54
M-17	lb.	.46	/ .51
No. 140	lb.	.3225	/ .38
Sebacic acid	lb.	.57	/ .61
Seedine	lb.	.1485	/ .1705
Solvenol	gal.	.56	/ .58
Staybelite Resin	lb.	.06	/ .065
Stearex Beads	lb.	.14⅞	/ .15⅞
Stearic acid, single pressed	lb.	.24	/ .25
Double pressed	lb.	.245	/ .255
Triple pressed	lb.	.2725	/ .285
Stearite	lb.	.14⅞	
Synthol	lb.	.255	
"Thiokol" LP-3	lb.	.85	
TP-90B	lb.	.65	
-95	lb.	.55	
-98	lb.	.50	
TR-11	lb.	.035	
Tricresyl phosphate	lb.	.415	/ .435
Turgum S	lb.	.095	/ .105
Tysonite	lb.	.215	/ .2225
Vistac No. 1	gal.	1.21	/ 1.32
2	gal.	1.62	/ 1.66
4	gal.	1.76	/ 1.80
X-1 Resinous Oil	lb.	.025	
XX-100 Resin	lb.	.0525	
Zinc laurate	lb.	.45	/ .46

Reclaiming Oils

Bardex	lb.	.05	/ .0525
Bardol	lb.	.0275	/ .0375
B	lb.	.055	/ .0575
B. R. H No. 2	lb.	.02	/ .029
B. R. T. No. 3	lb.	.024	/ .025
No. 4	lb.	.013	/ .0235
B. R. V.	lb.	.0325	/ .049
BWH-1	lb.	.14	
Dipentene 122	gal.	.60	/ .75
Dipolymer Oil	gal.	.33	/ .38
Dispersing Oil No. 10	lb.	.0525	/ .055
G. B. Reclaiming Oil	gal.	.12	/ .18

Heavy Resin Oil	lb.	$0.0225	/ $0.0325
LX-83	gal.	.15	/ .23
-572	gal.	.20	/ .28
No. 1 Heavy Oil	lb.	.055	
No. 1621	lb.	.025	/ .035
Picco C-10	gal.	.25	/ .30
C-28	gal.	.33	/ .38
C-33	gal.	.20	/ .25
C-42	gal.	.27	/ .32
D-4	gal.	.23	/ .28
E-5	gal.	.21	/ .26
Q Oil	gal.	.246	/ .296
PT 101 Pine Tar Oil	gal.	.32	/ .43
150 Pine Solvent	gal.	.44	/ .55
Solvenol	gal.	.56	/ .58
S. R. O.	lb.	.015	/ .0225
Wilcor Nos. 111, 151	gal.	.26	/ .30
X-50 Solvent	gal.	.24	/ .32
X-443	gal.	.20	/ .27

Reinforcers, Other Than Carbon Black

B. R. C. Nos. 18, 19E, 20, 22	lb.	.0125	/ .0135
Bunarex resins	lb.	.06	/ .125
Calcene T	ton	40.00	/ 50.00
Calco S. A.	lb.	.75	
Carbonex, flakes	lb.	.0325	/ .0375
S Flakes	lb.	.0475	/ .0525
Plastic	lb.	.046	/ .051
Clays			
Aluminum Flake	ton	16.00	/ 22.00
No. 5	ton	20.00	
Barden	ton	12.00	
Buca	ton	40.00	
Catalpo	ton	30.00	
China	ton	9.50	/ 16.00
Dixie	ton	13.00	
Hydratex R	ton	28.00	
L. G. B.	ton	17.00	
Paragon (R)	ton	12.50	/ 29.00
Pigment No. 33	ton	30.00	
Suprex	ton	13.00	/ 29.50
Witco Nos. 1, 2	ton	25.00	
Clearcarb	lb.	.1175	/ .1225
Cumar EX	lb.	.0525	
MH	lb.	.065	/ .1175
V	lb.	.0975	/ .1275
Darex Copolymer Nos. 3, X 34	lb.	.35	/ .37
No. X 43	lb.	.36	/ .38
G Resin	lb.	.08	
Good-Rite Resin 50	lb.	.415	/ .455
Magnesia, Calcined			
Extra Light, U.S.P.	lb.	.34	
K&M	lb.	.31	
Light, technical	lb.	.28	
No. 101	lb.	.175	
Heavy, technical	lb.	.05	/ .1275
Medium light, technical	lb.	.12	
Magnesium carbonate	lb.	.09	/ .135
Marbon S, S-1	lb.	.36	/ .43
Millical	ton	25.00	
Multifex	ton	105.00	
Neville R Resins	lb.	.10	/ .155
Para Resins 2457, 2718	lb.	.04	/ .045
Picco-75, -100	lb.	.115	/ .17
Piccolastic Resins	lb.	.139	/ .275
Piccolyte Resins	lb.	.15	/ .2075
Piccoumaron Resins	lb.	.06	/ .17
Piccovars	lb.	.0975	/ .1675
Pliolite, Natural Rubber	lb.	.75	/ .82
Milled	lb.	.85	/ .92
S-2, Milled	lb.	.74	/ .81
S-3, -6	lb.	.36	/ .43
S-6 Masterbatches	lb.	.35	/ .50
PS-60 Resin	lb.	.35	
Resin C Pitch	lb.	.02	/ .0285
Resinex	lb.	.0325	/ .0375
S-Polymers	lb.	.44	
Silene EF	lb.	.055	/ .06
Super Multifex	ton	145.00	
Witcarb R	ton	100.00	
R-12	ton	32.50	
Zinc oxide, commercial†	lb.	.11	/ .17

Retarders

Cumar RH	lb.	.105	
Delac J	lb.	.55	/ .60
E-S-E-N	lb.	.36	/ .41
Good-Rite Vultrol	lb.	.55	/ .57
M-B-T	lb.	.27	/ .33
M-B-T-S	lb.	.35	/ .41
R-17 Resin	lb.	.1075	
Retarder PD	lb.	.36	
W	lb.	.43	
Retardex	lb.	.475	
RM	lb.	1.25	
Thionex	lb.	1.25	
Thiuram E, M	lb.	1.25	
Vultrol	lb.	.50	/ .55

Solvents

Benzol, industrial	gal.	.20	/ .21
Bondogen	lb.	.55	/ .60
Carbon bisulfide	lb.	.0575	/ .0875
Tetrachloride	lb.	.075	/ .11
Cosol No. 1	gal.	.30	/ .38
No. 2	gal.	.30	/ .38
GVL	lb.	1.00	
Nevsol	gal.	.185	/ .25
Picco Hi-Solv Solvents	gal.	.21	/ .26
Skellysolve-B	gal.	.141	
C	gal.	.133	
R	gal.	.109	
Tollac	gal.	$0.195	/ $0.25
Toluol, industrial	gal.	.23	/ .29
2-50-W Hi-Flash Solvent	gal.	.37	
X-60 Solvent	gal.	.24	/ .32
Xylol, industrial	gal.	.23	/ .28

Synthetic Resins

Marvinol VR-10	lb.	.33	/ .50

Synthetic Rubbers and Latices

Butaprene NAA	lb.	.44	/ .465
NF	lb.	.39	/ .415
NL	lb.	.40	/ .425
NXM	lb.	.47	/ .495
Butaprene Latex (dry wt.)			
NI, NXM	lb.	.455	/ .49
Chemigum N-1	lb.	.53	/ .60
Chemigum Latex Type 101 (dry wt.)	lb.	.37	/ .40
Hycar OR-15	lb.	.455	/ .53
-25, -25 EP, OS-10	lb.	.40	/ .435
-25 NS	lb.	.42	/ .455
Hycar Latex (dry wt.)			
1501, 1531, 1551	lb.	.48	/ .53
1502, 1552, 1562	lb.	.41	/ .46
1532	lb.	.425	/ .475
Neoprene Latex (dry wt.)			
Type 571, 842, 842-A	lb.	.29	/ .37
572, 700	lb.	.30	/ .38
601, 601-A	lb.	.32	/ .40
Neoprene Type AC, CG	lb.	.50	
E, M	lb.	.65	
FR, KNR	lb.	.75	
NC	lb.	.35	
Paraplex X-100	lb.	1.00	
Perbunan 18	lb.	.43	/ .45
26NS60, 26NS90	lb.	.44	/ .46
35NS90	lb.	.51	/ .53
Perbunan Latex Type H (55%)	lb.	.38	/ .42
Silastic No. 121	lb.	2.35	/ 2.75
122	lb.	3.20	/ 3.60
123	lb.	3.60	/ 4.00
125	lb.	3.80	/ 4.40
126	lb.	4.00	/ 4.40
150, 180	lb.	3.35	/ 3.95
160, 167	lb.	2.90	/ 3.50
181	lb.	3.55	/ 4.15
"Thiokol" Latex (dry wt.)			
MF	lb.	.70	
MX	lb.	.50	
WD-2	lb.	.75	
"Thiokol" LP-2	lb.	.85	
PR-1	lb.	.75	
Type A	lb.	.37	
FA	lb.	.52	
ST	lb.	.75	

Tackifiers

Bunarex-10, 25, -40	lb.	.07	/ .125
Contogums	lb.	.0875	/ .11
Galex W-100	lb.	.135	/ .1725
W-100 D	lb.	.1325	/ .17
Hercolyn	lb.	.1122	/ .1347
Natac	lb.	.105	/ .115
Nevillac	lb.	.23	/ .25
Nevilloid C-55	lb.	.12	
Nevindene	lb.	.125	/ .155
Picco-10, -25	lb.	.12	/ .17
Piccolastic Tackifiers	lb.	.139	/ .275
Piccolyte Resins	lb.	.15	/ .2075
Piccoumaron Resin 427-R	lb.	.12	/ .17
Resins	lb.	.06	/ .17
Staybelite Resin	lb.	.06	/ .065
Synthetic 100	lb.	.41	
Synthol	lb.	.255	
Vistac No. 1	gal.	1.21	/ 1.32
No. 2	gal.	1.62	/ 1.66
4	gal.	1.76	/ 1.80
Vistanex	lb.	.32	/ .36

Vulcanizing Agents

Dibenzo G-M-F-	lb.	2.65	
Ethyl Tuads	lb.	1.00	
G-M-F	lb.	2.50	
Litharge, commercial	lb.	.2325	/ .245
Eagle, sublimed	lb.	.2425	/ .2435
Magnesia, Calcined			
Carey	lb.	.28	
Extra-light, U.S.P.	lb.	.34	
Heavy, technical	lb.	.05	/ .31
K&M Neoprene Grade	lb.	.31	
Light, technical	lb.	.22	/ .28
No. 101	lb.	.175	
Medium-light, technical	lb.	.175	
Methyl Selenac	lb.	1.60	
Tuads	lb.	1.10	
Red lead, commercial	lb.	.2425	/ .2575
Eagle	lb.	.2525	
Sulfur flour, comml	100 lbs.	1.60	/ 2.30
Crystex	lb.	.195	/ .23
Dichloride	lb.	.0325	/ .0825
Insoluble 60	lb.	.13	/ .135
Monochloride	lb.	.0325	/ .0825
Rubbermakers	100 lbs.	1.75	/ 2.95
Telloy	lb.	2.00	
"Thiokol" CA-10	lb.	1.50	
Vandex	lb.	2.00	
Vultac Nos. 1, 2	lb.	.38	/ .45
No. 3	lb.	.42	/ .49
White lead silicate	lb.	.1925	/ .2635
Eagle	lb.	.233	/ .2635

Estimated Automotive Pneumatic Casings and Tube Shipments, Production, and Inventory, September, August, 1948; First Nine Months, 1948-1947

	1948 September	% of Change from Preceding Month	August	First Nine Months	1947, First Nine Months
Passenger Casings					
Shipments					
Original equipment	1,718,022		1,884,121	15,695,737	14,281,252
Replacement	3,770,876		4,636,782	33,242,131	39,834,660
Export	41,950		55,061	480,274	1,222,432
TOTAL	5,530,848	−15.89	6,575,964	49,418,142	55,338,344
Production	5,740,418	− .49	5,786,614	51,630,101	57,422,752
Inventory end of month	7,848,143	+ 5.16	7,462,765	7,848,153	3,704,077
Truck and Bus Casings					
Shipments					
Original equipment	396,154		405,751	4,073,780	4,161,673
Replacement	689,328		772,331	5,893,556	7,265,323
Export	84,006		80,837	863,367	1,275,929
TOTAL	1,169,488	− 7.10	1,258,919	10,830,703	12,702,925
Production	1,174,108	− 1.66	1,193,942	11,174,228	13,472,313
Inventory end of month	1,957,080	+ 3.56	1,889,777	1,957,080	1,485,105
Total Automotive Casings					
Shipments					
Original equipment	2,114,176		2,289,872	19,769,517	18,442,925
Replacement	4,460,204		5,409,113	39,135,687	47,099,983
Export	125,956		135,898	1,343,641	2,498,361
TOTAL	6,700,336	−14.48	7,834,883	60,248,845	68,041,269
Production	6,914,526	− .69	6,962,556	62,804,329	70,895,065
Inventory end of month	9,805,223	+ 4.84	9,352,542	9,805,223	5,189,182
Passenger and Truck and Bus Tubes					
Shipments					
Original equipment	2,112,164		2,292,212	19,772,611	18,431,639
Replacement	4,006,637		4,522,117	31,954,769	34,603,776
Export	81,243		102,811	823,700	2,089,630
TOTAL	6,200,044	−10.37	6,917,140	52,551,080	55,125,045
Production	6,191,462	− 6.74	6,638,552	53,329,504	58,553,096
Inventory end of month	8,778,449	+ 2.94	8,527,448	8,778,449	6,390,853

NOTE: Cumulative data on this report include adjustments made in prior months.
SOURCE: The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York 22, N. Y.

United States Rubber Statistics—August, 1948

(All Figures in Long Tons, Dry Weight)

	New Supply: Production	Imports	Total	Distribution: Consumption	Exports	Stocks
Natural rubber, total	0	65,736	65,736	51,306	520	118,330
Natural latex, total	0	2,395	2,395	2,060	0	11,292
Natural rubber and latex, total	0	68,131	68,131	53,366	520	129,622
Synthetic rubber, total	* 37,822 † 1,808	3,599	43,229	39,339	276	97,262
GR-S	* 33,155 † 444	‡2,727	36,326	‖30,042	37	§82,167
Butyl	* 2,634	¶872	3,506	5,656	Below 0.5	7,384
Neoprene	* 2,033 † 579	0	2,612	2,948	49	15,319
Nitrile	† 785	0	785	693	190	2,392
Natural rubber and latex, and synthetic rubber, total	39,630	71,730	111,360	92,705	796	226,884
Reclaimed rubber	20,255	0	20,255	‖22,917	643	32,025
GRAND TOTALS	59,885	71,730	131,615	115,622	1,439	258,909

* Government plant production.
† Private plant production.
‡ Includes 583 tons for August, and adjustments of +248 tons for April, +89 tons for May, +887 tons for June, and +920 tons for July.
§ Includes 65 tons shipped for export, but not cleared.
¶ Includes 810 tons for August, and adjustments of +10 tons for June and +52 tons for July.
SOURCE: Rubber Division, ODC, United States Department of Commerce, Washington, D. C.

Rims Approved and Branded by The Tire & Rim Association, Inc.

RIM SIZE	Oct., 1948
15" & 16" D. C. Passenger	
15x3.50D	10,012
16x4.00E	141,636
16x4.50E	106,823
15x5.00E	142,497
16x5.00F	28,809
15x5.50F	6,593
16x5.50F	19,909
16x4.00E—Hump	12,983
16x4.50E—Hump	19,867
15x5.00F—Hump	4,348
15x4½-K	17,586
16x4½-K	52,003
15x5-K	366,546
16x5-K	155,029
15x5½-K	133,903
16x5½-K	2,481
15x6-L	98,781
16x6-L	33,642
15x6½-L	170,834
15x4½-K—Hump	191,474
15x5-K—Hump	98,120
15x5½-K—Hump	98,928
15x6-L—Hump	32,048
17" & Over	
18x3.62F	3,799
Truck-Bus	
17x4.33R	1,004
20x4.33R	4,929
17x5.0	17,628
18x5.0	18,596
20x5.0	34,676
15x5.00S	551
20x5.00S	28,166
17x5.5	9,959
15x5.50S	4,691
24x5.50S	278
20x6.0	103,630
20x6.00S	91,226
20x6.00T	474
24x6.00T	709
20x6.5	8,121
20x6.50T	6,763
20x7.0	18,351
18x7.00T	631
20x7.00T	15,147
20x7.33V	3,975
22x7.33V	2,110
15x7.5	1,383
20x7.5	15,021
22x7.5	6,473
24x7.5	8
20x7.50V	6,590
20x7.50V—Flat Base	7,571
22x7.50V	2,021
22x7.50V—Flat Base	3,229
20x8.0	4,773
22x8.0	1,568
24x8.0	766
20x8.00V	4,389
22x8.00V	2,221
19x8.37V	71
20x8.37V	49
20x10.0	1,278
Semi D. C. Truck	
16x4.50E	17,270
15x5.50F	52,633
16x5.50F	6,583
Tractor & Implement	
12x2.50C	3,618
12x3.00D	8,287
15x3.00D	11,270
16x3.00D	10,983
18x3.00D	3,104
19x3.00D	23,734
21x3.00D	6,019
36x3.00D	1,609
16x4.25KA	2,756
20x4.50E	10,028
36x4.50E	1,483
18x5.50F	12,655
24x5.50R	554
24x8.00T	4,696
28x8.00T	1,278
32x8.00T	407
36x8.00T	260
W5-30	7,278
W6-24	7,666
W7-24	11,211
W7-32	1,560
W7-36	545
W8-24	10,993
W8-32	582
W8-36	1,594
W9-24	1,941
W9-28	28,922
W9-36	409
W9-38	7,081
W10-24	1,070
W10-28	3,953
W10-38	8,099
W11-26	671
W12-38	1,744
DW8-42	401
DW9-38	10,370
DW10-38	4,074
DW10-42	1,539
DW11-28	518
DW11-38	3,646
DW12-26	2,354
DW12-30	8,854
DW12-34	767
DW16-26	247
Earth Mover	
24x11.25	24
24x13.00	165
32x13.00	18
25x17.00	64
29x17.00	123
TOTAL	2,685,327

Trade Lists Available

The Commercial Intelligence Division, United States Department of Commerce, Washington, D. C., recently compiled the following trade lists, of which mimeographed copies may be obtained by American firms interested in the Division and from Department of Commerce field offices at $1 a list for each country.

Aircraft & Aeronautical Supply & Equipment Importers & Dealers—Cuba; Denmark; Indo-China; Norway; Philippines; Switzerland.

Automotive Equipment Importers & Dealers—Argentina; Austria; Bolivia; El Salvador; Egypt; Netherlands India; Paraguay.

Automotive Product Manufacturers—Austria; British Malaya; Poland.

Boot & Shoe Importers & Dealers—Austria; Sweden.

Boot & Shoe Manufacturers—Dominican Republic; Ireland; Sweden.

Chemicals Importers & Dealers—Bahamas; British Guiana; Cuba; Denmark; Greece.

Corset, Brassiere, Garter, Suspender & Girdle Manufacturers & Exporters—Norway; Portugal.

Dental Supply Houses—British Malaya; Finland; France.

Electrical Supply and Equipment Importers and Dealers—Algeria; Guatemala; Netherlands India; Argentina; Greece; Belgium; India; Cuba; Denmark; Philippines; Siam.

Malayan Rubber Statistics

The following statistics for September, 1948, have been received from Singapore by way of Malaya House, 57 Trafalgar Square, London, W. C. 2, England.

Ocean Shipments from Singapore and Malayan Union—In Tons

	Sheet and Crepe			Latex, Concentrated Latex, and Revertex (Dry Rubber Cement)		
	Singapore	Malayan Union		Singapore	Malayan Union	
To	Export Proper	Trans-shipped	Direct Shipments	Export Proper	Trans-shipped	Direct Shipments
Argentine Republic	73	68	89	20	...	...
Australia	2,354	373	5	46	92	...
Belgium	153	65	800	36	9	2
Canada	1,246	58	1,523	...	...	...
Chile	135	10	1	...	...	...
China	1,214	...	84	...	...	...
Czechoslovakia	...	...	75	...	...	...
Denmark	239	10	175	2	4	...
Egypt	7	...	...	...	...	...
Finland	...	...	...	1	...	...
France	1,524	160	1,640	93	47	34
Germany	1,482	150	1,212	103	...	...
Hong Kong	284	...	199	...	...	...
Italy	646	183	860	...	78	1
Japan	75	...	50	...	...	...
Mexico	426	...	280	...	...	...
Netherlands	20	205	188	20	1	...
Norway	55	50	159	...	4	6
Other countries in Africa	100	...	...	...	...	...
Asia	2	...	...	...	...	...
South America	170	3	151	...	3	...
Pakistan	15	...	...	...	...	...
Philippine Islands	...	...	...	1	...	...
Portugal	72	15	65	...	...	...
Rumania	350	...	...	...	...	...
Russia	10,314	...	3,949	...	...	...
Spain	50	...	300	...	...	...
Sweden	166	50	347	6	...	...
Switzerland	...	...	5	...	...	...
Turkey	130	40	105	...	...	...
Union of India	175	...	875	...	...	...
Union of South Africa	1,754	160	459	9	25	...
United Kingdom	4,420	2,390	10,578	760	8	87
U. S. A.	13,033	1,479	15,856	1,498	...	813
TOTAL	40,684	5,469	39,824	2,595	271	943

Foreign Imports of Rubber in Long Tons

Singapore Imports from	Dry Rubber	Wet Rubber (Dry Weight)
Bali and Lombok	22	...
Banka and Billiton	159	...
Brunei	169	1
Dutch Borneo	1,399	115
Java	1,575*	...
North Borneo	950	38
Other Dutch Islands	56	37
Rhio Residency	622	44
Sarawak	3,037	9
Sumatra	6,378	8,906
TOTAL	14,367	9,150

* Includes 1,176 tons sole crepe.

Federation of Malaya Imports from

Burma	22	2
Siam	715	3
Sumatra	1,846	1,021
TOTAL	2,583	1,026

Dealers Stocks

	Tons
Penang and Province Wellesley	11,736
Singapore	47,933
TOTAL	59,669

Port Stocks in Private Lighters and Railway Godowns

Penang & Province Wellesley	5,362
Port Dickson	15
Port Swettenham	4,546
Singapore	10,021
Teluk Anson	318
TOTAL	20,262

Production

Estates	33,292
Small holdings (estimated)	30,910
TOTAL	64,202

United States Imports, Exports, and Reexports of Crude and Manufactured Rubber

Exports of Domestic Merchandise

	August 1948 Quantity	August 1948 Value
UNMANUFACTURED, Lbs.		
Chicle	35,519	$27,314
Balata	100	350
Jelutong, gutta percha, and similar gums	600	2,100
Synthetic rubbers: GR-S	83,255	23,821
Butyl	800	152
Neoprene	108,802	42,651
Nitrile	425,845	172,926
"Thiokol"	1,500	607
Polyisobutylene	6,025	2,196
Other	1,560	898
Reclaimed rubber	1,441,034	111,420
Scrap rubber	2,325,243	54,174
TOTALS	4,430,283	$438,609
MANUFACTURED		
Rubber cement ... gals.	40,760	$54,499
Rubberized fabric: auto cloth ... sq. yds.	55,075	56,870
Piece goods and hospital sheeting ... sq. yds.	70,011	59,470
Rubber footwear:		
Boots ... prs.	9,200	41,661
Shoes ... prs.	9,172	22,142
Rubber-soled canvas shoes ... prs.	46,515	74,612
Soles ... doz. prs.	17,827	54,942
Heels ... doz. prs.	35,175	28,043
Rubber soling and top-lift sheets ... lbs.	96,915	19,823
Gloves and mittens ... doz. prs.	10,041	34,104
Drug sundries: water bottles and fountain syringes ... no.	28,022	14,541
Other	......	191,583
Rubber and rubberized clothing	......	88,808
Balloons	......	69,098
Toys and balls	......	48,009
Bathing caps ... doz.	1,064	4,686
Rubber bands ... lbs.	3,147	2,959
Erasers ... lbs.	13,327	8,758
Hard rubber goods:		
Battery boxes ... no.	36,767	53,706
Other elec. goods ... lbs.	145,626	69,645
Combs, finished ... doz.	1,984	4,716
Other goods	......	12,041
Tire casings: truck and bus ... no.	66,543	2,928,638
Auto ... no.	46,942	614,299
Inner tubes: auto, truck, and bus ... no.	75,374	263,492
Other casings and tubes, except auto ... no.	58,684	1,098,880
Solid tires: auto and truck ... no.	3,568	128,938
Other ... lbs.	11,237	7,063
Tire repair materials: camelback ... lbs.	117,364	35,792
Other ... lbs.	182,528	96,450
Rubber and friction tape ... lbs.	37,307	30,689
Belting: auto fan belts ... lbs.	66,108	70,678
Other ... lbs.	1,639,196	1,316,959
Hose and tubing:		
Garden hose ... lbs.	55,785	18,448
Other ... lbs.	506,991	381,540
Rubber packing ... lbs.	111,320	85,996
Mats, flooring, tiling lbs.	743,335	195,074
Thread: bare ... lbs.	27,038	33,551
Textile covered ... lbs.	8,466	23,810
Gutta percha manufactures ... lbs.	1,722	3,412
Latex and other compounded rubber for further manufacture ... lbs.	552,627	157,642
Other rubber products	......	280,127
TOTALS		$8,786,194
GRAND TOTALS, ALL RUBBER EXPORTS	......	$9,224,803

Imports for Consumption of Crude and Manufactured Rubber

	August, 1948 Quantity	August, 1948 Value
UNMANUFACTURED, Lbs.		
Crude rubber	147,249,343	$26,975,557
Rubber latex	5,365,090	1,389,495
Balata	131,254	50,511
Jelutong or Pontianak	250,054	107,431
Gutta percha	117,959	39,607
Chicle	182,618	111,294
Synthetic rubber	3,119,237	581,110
Reclaimed rubber	20,178	1,164
Scrap rubber	1,366,841	21,903
TOTALS	157,802,574	$29,278,072
MANUFACTURED		
Tires: auto, bus, truck no.	532	$6,082
Bicycle ... no.	1,342	1,618
Inner tubes ... no.	116	322
Rubber-soled canvas shoes ... prs.	80	403
Balls: golf ... no.	8,268	3,198
Other, except tennis no.	228,600	24,379
Toys, except balloons	......	2,125
Hard rubber products	......	345
Rubberized printing blankets ... lbs.	132	333
Rubber and cotton packing ... lbs.	5,500	6,452
Gaskets and valve packing	......	736
Molded rubber insulators	......	434
Rubber belting ... lbs.	10	4
Hose and tubing	......	24
Drug sundries	......	349
Rubber bands ... lbs.	1,851	792
Heels and soles ... lbs.	300	70
Soft rubber goods, except drug sundries	......	8,195
Other rubber products	......	3
Gutta percha manufactures ... lbs.	25	37
Synthetic rubber products	......	589
TOTALS	......	$56,470
GRAND TOTALS, ALL RUBBER IMPORTS	......	$29,334,542

Reexports of Foreign Merchandise

	Quantity	Value
UNMANUFACTURED, Lbs.		
Crude rubber	1,165,591	$268,912
Balata	4,097	1,310
TOTALS	1,169,688	$270,222
MANUFACTURED		
Rubber soling and toplift sheets ... lbs.	2,706	$1,504
Drug sundries, except syringes and hot water bottles	......	1,366
Rubber toys and balls	......	594
Tire casings: truck and bus ... no.	16	2,260
And tubes, except auto no.	3,200	2,151
Rubber belting: auto fan belts ... lbs.	400	505
Other ... lbs.	100	102
Hose and tubing, except garden hose ... lbs.	978	331
Packing ... lbs.	610	370
TOTALS	......	$9,183
GRAND TOTALS, ALL RUBBER REEXPORTS	......	$279,405

SOURCE: Bureau of Census, United States Department of Commerce, Washington, D. C.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

Effective July 1, 1947

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.25 per line (ten words)	Light face type 40c per line (ten words)	Light face type $1.00 per line (ten words)
Bold face type $1.60 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.40 per line (eight words)
Allow nine words for keyed address.	**Address All Replies to New York Office at 386 Fourth Avenue, New York 16, N. Y.**	*Letter replies forwarded without charge, but no packages or samples.*

SITUATIONS OPEN

Rubber Chemist. Excellent oportunity to achieve key position in well-established Ohio company. Initiative and some practical experience in compounding and processing of rubber required. Our Technical Staff knows of this advertisement. State age, experience, and salary expected. All replies kept confidential. Address: Box No. 264, care of India RUBBER WORLD.

WANTED: Rubber products Technician and production man. Must be able to estimate jobs for point of sale displays. Knowledge of plaster molding necessary. Creative ability desired. Good opportunity for man of proven worth. Address: Box No. 262, care of India RUBBER WORLD.

SALES AND TECHNICAL MANAGER

LARGE EASTERN RUBBER RECLAIMING PLANT HAS unusual opening for a competent and experienced man who can take complete charge of sales and technical departments. Applicant should be thoroughly familiar with the manufacture and uses of reclaimed rubber and have the ability to develop sales and research programs. This is a fine opportunity for the right man. Write in detail past experiences and salary expected. All replies will be kept in strict confidence. Address Box No. 253, care of INDIA RUBBER WORLD.

RUBBER FACTORY IN ARGENTINA NEEDS CHEMIST EXperienced in compounding and production process of vulcanizing shoes with cork rubber sole, molded articles, etc. Knowledge of Spanish preferred. Write giving full information regarding experience and salary desired. Address Box No. 249, care of INDIA RUBBER WORLD.

REPRESENTATIVES WANTED — RUBBER COMPOUNDING resins for use in synthetic and natural rubbers; also liquid urea resins for latices. Territories, Manhattan and upper New York State. Salary or commission basis. Address Box No. 250, care of INDIA RUBBER WORLD.

TIRE DEVELOPMENT ENGINEER- OPENING WITH EXCEPtional opportunity for young man who has experience in tire design and tire development. Give full details first letter. Replies held in full confidence. Address Box No. 251, care of INDIA RUBBER WORLD.

FOREMAN OR FORELADIES, EXPERIENCED IN HANDLING trimming department, or pressroom or general supervision. Apply MARTIN RUBBER COMPANY, Long Branch, N. J.

ASSISTANT CHEMIST, MUST BE THOROUGHLY ACQUAINTED with automotive, aeronautical and Navy Department specifications. Apply MARTIN RUBBER COMPANY, Long Branch, N. J.

WANTED: A MAN THOROUGHLY EXPERIENCED IN MODERN mill and calender room practices to act as consultant for a Midwest manufacturer. Give experience in detail, and state how much of your time would be available. Address Box No. 252, care of INDIA RUBBER WORLD.

MECHANICAL GOODS CHEMIST WANTED BY SMALL, AGgressive company manufacturing molded, extruded and calendered rubber goods. Must have good background and references. Address Box No. 258, care of INDIA RUBBER WORLD.

SITUATIONS OPEN (Continued)

AGGRESSIVE TECHNICAL SALESMAN required for position of opportunity in financially stable small company. Must travel Eastern half U.S.A., but not unreasonably.

Practical experience utilizing rubber and latex in dipped goods, cements, adhesives, and coatings very desirable. We are _not_ compounded latex suppliers, however.

Write full details of past employment, experience, and remuneration required, as well as reasons for desiring technical sales work.

Address Box No. 245, care of India RUBBER WORLD.

TECHNICAL AND RESEARCH ENGINEER

EXCELLENT OPPORTUNITY FOR CREATIVE AND RESEARCH minded engineer with well-established rubber company where his new ideas, inspirational and organizational qualifications will permit him to work with large group of technical and development engineers. This requires above average engineer. Age 30 to 40. Furnish complete information in first letter. Replies held in strict confidence. Address Box No. 254, care of INDIA RUBBER WORLD.

RUBBER CHEMIST OR TECHNICIAN TO HELP IMPROVE quality and reduce costs in molding department of small progressive company. Good future for the right man. MAYFAIR MOLDED PRODUCTS CORP., 4440 N. Elston Ave., Chicago, Ill.

SALESMEN WANTED: MIDWEST RUBBER PLANT MANUFACturing Mechanical and Sponge Rubber Products, has open territories for salesmen calling on the Industrial Trade. Commission basis. State qualifications and background in reply. Address Box No. 263, care of INDIA RUBBER WORLD.

SITUATIONS WANTED

SUPERINTENDENT-CHEMIST, NOW EMPLOYED, DESIRES new connections. Twenty years' practical experience, large and small plants manufacturing mechanical and sponge rubber items. Educated chemical-mechanical engineer. Location immaterial. Address Box No. 248, care of INDIA RUBBER WORLD.

DEVELOPMENT AND PRODUCTION CHEMIST—OVER 20 years' experience in fabric coating, paper treatment, with latex, natural and synthetic rubber, all types resins; extensive plastic and rubber molding; textile processing. Also diversified chemical, technical research work. Broad engineering background. Executive management, production, and technical service experience. Patents registered. Age 49; B.S. Chem.; available short notice. Address Box No. 265, care of INDIA RUBBER WORLD.

GRADUATE MECHANICAL ENGINEER—OHIO PROFESSIONAL engineers' license—over 18 years' experience in machine shop, cost estimating, laboratory work, steel product development, rubber product and equipment development, machine design, departmental layouts, cost cutting, and supervision. Will relocate. Address Box No. 259, care of INDIA RUBBER WORLD.

COATINGS—LAMINATIONS—IMPREGNATIONS ADHESIVES

Consulting Technical Director of leading company for the past seven years will be available shortly due to reorganization.
Textiles, papers, and metals. Rubbers, resins, lacquers, and colors.
Production or Development.
Metropolitan New York only.
Address Box No. 247, care of INDIA RUBBER WORLD.

(Classified Advertisements Continued on page 419)

FINANCIAL

American Cyanamid Co., New York, N. Y., and subsidiaries. First nine months, 1948: net income, $10,353,762, equal to $3.78 a common share, contrasted with $7,199,544, or $2.63 a share, in the 1947 period; net sales, $171,865,979, against $155,099,434.

American Zinc, Lead & Smelting Co., New York, N. Y., and wholly owned subsidiaries. Year ended September 30: net profit, $658,420, equal to 47¢ each per common share, compared with $1,211,349, or $1.29 a share, in the same period of 1947; net sales, $38,492,474, against $33,792,643.

Columbian Carbon Co., New York, N. Y., and subsidiaries. First nine months, 1948: net income, $4,822,626, equal to $2.99 each on 1,612,218 capital shares, compared with $4,680,587, or $2.90 a share, in the corresponding period of 1947; sales, $31,394,497, against $30,560,953; reserve for income taxes, $2,350,000, against $2,250,000.

Crown Cork & Seal Co., Inc., Baltimore, Md., and wholly owned domestic subsidiaries. Nine months to September 30: net income, $4,014,101, equal to $2.98 each on 1,207,790 common shares, compared with $3,100,354, or $2.22 each on 603,895 shares, in the 1947 months; net sales, $76,815,928, against $59,956,582; provision for federal taxes, $2,701,050, against $1,903,389.

DeVilbiss Co., Toledo, O., and wholly owned subsidiary. First three quarters, 1948: net profit, $448,159, equal to $1.49 each on 300,000 common shares, against $406,464, or $1.35 a share, a year earlier; provision for federal taxes, $360,200, against $355,600.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Nine months ended September 30, 1948: net income, $101,570,845, equal to $8.36 a common share, contrasted with $88,220,901, or $7.27 a share; sales, $708,698,371, against $573,572,354; provision for taxes, $61,570,000, against $48,100,000.

Electric Hose & Rubber Co., Wilmington, Del. Year ended August 31, 1948: net income, $483,794, equal to $3.86 a share, against $645,096, or $5.04 a share, in the preceding fiscal year; net sales, $10,144,596, against $9,559,833.

Flintkote Co., New York, N. Y., and subsidiaries. Forty weeks ended October 9: net profit, $6,480,671, equal to $4.92 each on 1,257,925, common shares, against $6,102,511, or $4.91 each on 1,183,921 shares; net sales, $64,683,038, against $55,191,448; income taxes, $4,147,341, against $3,924,936.

Hewitt-Robins, Inc., Buffalo, N. Y. Third quarter, 1948: net income, $155,469, equal to 56¢ each on 278,714 common shares, against $200,716, or 72¢ a share, in the corresponding quarter of 1947.

Pharis Tire & Rubber Co., Newark, O. Seven months ended July 31, 1948: net loss, $382,386; net sales, $5,618,039.

General Cable Corp. New York, N. Y. Nine months to September 30: net income, $3,193,891, equal to $1.37 each on 1,914,010 common shares, against $4,627,400, or $2.09 each on 1,898,610 shares, in the same months last year; provision for federal income taxes, $1,965,000, against $2,985,000.

Link-Belt Co., Chicago, Ill., and subsidiaries. Nine months ended September 30: net profit, $7,174,152, equal to $8.81 each on 814,226 common shares, compared with $4,809,444, or $5.95 each on 807,930 shares, in the corresponding months of 1947; net sales, $77,965,051, against $62,651,193; provision for taxes, $4,737,000, against $3,120,000.

Minnesota Mining & Mfg. Co., St. Paul, Minn., and subsidiaries. Nine months ended September 30: net profit, $9,358,641, equal to $4.64 each on 1,951,531 capital shares, against $8,381,830, or $4.30 a share, a year earlier; net sales, $79,841,184, against $68,550,239.

Monsanto Chemical Co., St. Louis, Mo. First three quarters, 1948: net profit, $11,568,483, equal to $2.51 each on 4,274,495 common shares, against $12,395,367, or $2.79 each on 4,231,497 shares, in the corresponding period of 1947; sales, $119,382,197, against $105,829,063.

Pittsburgh Plate Glass Co., Pittsburgh, Pa. First three quarters, 1948: net earnings, $23,095,998, equal to $2.58 a share, contrasted with $21,071,104, or $2.36 a share, in the 1947 period; sales, $206,864,606, against $196,623,041.

Phillips Petroleum Co., Bartlesville, Okla., and subsidiaries. First nine months, 1948: net profit, $55,702,722, equal to $9.21 each on 6,045,255 shares, contrasted with $25,706,157, or $5.20 each on 4,939,890 shares, in the like period last year; reserve for depreciation, etc., $31,379,863, against $25,613,154; provision for federal income taxes $18,385,500, against $9,831,100.

Sun Chemical Corp., New York, N. Y., and subsidiaries. Nine months ended September 30: net profit, $711,738, equal to 54¢ each on 1,196,283 common shares, contrasted with $996,669, or 78¢ a share, in the corresponding months of 1947; net sales, $26,824,869, against $27,022,848; reserve for income taxes, $526,300, against $649,500.

Thermoid Co., Trenton, N. J., and subsidiaries. First three quarters, 1948: net profit, $681,458, equal to 77¢ each on 752,417 common shares, against $610,974, or 77¢ a share on 652,464 shares, for the same period in 1947; federal tax provision, $446,950, against $468,854; reserve for depreciation, $422,204, against $264,293.

Timken Roller Bearing Co., Canton, O. Nine months ended September 30: net profit, $11,177,441, equal to $4.62 a share, compared with $9,144,682, or $3.78 a share, in the corresponding period of 1947.

United States Rubber Co., New York, N. Y. Nine months ended September 30: net earnings, $15,216,798, equal to $6.42 a common share; provision for income taxes, $11,624,657; reserve for foreign exchange losses, $907,264; net sales, $431,930,181.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Belden Mfg. Co.	Com.	$0.30 q.	Dec. 1	Nov. 17
Boston Woven Hose & Rubber Co.	Pfd.	3.00 s.	Dec. 15	Dec. 1
Brown Rubber Co., Inc	Com.	0.25	Dec. 27	Nov. 26
Brunswick-Balke-Collender Co.	Com.	1.50 yr. end	Dec. 15	Dec. 1
	Pfd.	1.25 q.	Jan. 2	Dec. 20
Canadian Tire Corp	Com.	0.30 q.	Dec. 1	Nov. 20
Collyer Insulated Wire Co., Inc	Com.	0.20	Nov. 1	Oct. 25
Crown Cork & Seal Co., Inc	Pfd.	0.50 q.	Dec. 15	Nov. 19
E. I. du Pont de Nemours & Co., Inc.	Com.	3.75 yr. end	Dec. 14	Nov. 22
	$3.50 Pfd.	0.87½ q.	Jan. 25	Jan. 10
	$4.50 Pfd.	1.12½ q.	Jan. 25	Jan. 10
Dunlop Tire & Rubber Co.	Pfd.	0.62½ s.	Dec. 31	Dec. 18
Dunlop Tire & Rubber Goods Co., Ltd.	5% Cum. Red. 1st Pfd.	2½%	Dec. 31	Dec. 15
Firestone Tire & Rubber Co.	Pfd.	1.12½ q.	Dec. 1	Nov. 15
Flintkote Co.	Com.	0.50 extra	Dec. 10	Nov. 24
	Com.	0.50 q.	Dec. 10	Nov. 24
	Pfd.	1.00 q.	Dec. 15	Dec. 1
General Electric, Ltd	ADR	0.33 4/5	Nov. 5	Sept. 30
General Tire & Rubber Co.	Com.	0.25 q.	Nov. 30	Nov. 19
Goodall Rubber Co.	Com.	0.15	Nov. 15	Nov. 1
	Pfd.	2.50	Nov. 15	Nov. 1
B. F. Goodrich Co.	Com.	1.50 extra	Dec. 31	Dec. 10
	Com.	1.00	Dec. 31	Dec. 10
	Pfd.	1.25 q.	Dec. 31	Dec. 10
Goodyear Tire & Rubber Co.	Com.	0.50 reduced	Dec. 31	Dec. 10
Hewitt-Robins Inc	Com.	0.25 q.	Dec. 15	Nov. 29
Johns Manville Corp	Com.	0.95	Dec. 10	Nov. 29
Johnson & Johnson	Com.	0.30 extra	Dec. 14	Nov. 30
	Com.	0.20 q. incr.	Dec. 14	Nov. 30
	2nd Pfd.	1.00 q.	Feb. 1	Jan. 14
Midwest Rubber Reclaiming Co.	Com.	0.25 q.	Oct. 30	Oct. 18
	Pfd.	0.56¼ q.	Jan. 2	Dec. 13
Minnesota Mining & Mfg. Co.	Com.	0.60 incr.	Dec. 11	Nov. 20
	Pfd.	1.00 q.	Dec. 11	Nov. 20
National Automotive Fibres, Inc.	Com.	0.20	Dec. 24	Dec. 2
Raybestos-Manhattan, Inc.	Com.	1.00	Jan. 3	Nov. 30
Russell Mfg. Co.	Com.	0.37½ q.	Dec. 15	Nov. 30
Tyer Rubber Co.	Com.	1.00	Nov. 15	Nov. 8
	Pfd.	1.06¼	Nov. 15	Nov. 8
Union Asbestos & Rubber Co.	Com.	0.50 extra	Jan. 3	Dec. 10
	Com.	0.25 q.	Jan. 3	Dec. 10
United States Rubber Co.	Com.	1.00	Dec. 10	Nov. 22
	Pfd.	2.00 q.	Dec. 10	Nov. 22
Westinghouse Air Brake Co.	Com.	0.50 q.	Dec. 15	Nov. 15
S. S. White Dental Mfg. Co.	Com.	0.10 extra	Nov. 16	Nov. 1
	Com.	0.37½ q.	Nov. 16	Nov. 1
Whitehead Bros. Rubber Co.	Com.	0.15	Nov. 15	Nov. 1

CLASSIFIED ADVERTISEMENTS
Continued

MACHINERY & SUPPLIES FOR SALE

FOR SALE: 1—WATSON STILLMAN LOW AND HIGH (3000#) pressure with pumps, motors, and accessories. 1—48 x 48" 3-opening Hydraulic Press with 4-10" rams: other presses, various sizes. 1—5' x 24' Vulcanizer, 100# pressure, quick-opening door. 6—Royle and other Tubers 2½ to 8". Also mills, calenders, etc. Send us your inquiries. CONSOLIDATED PRODUCTS CO., INC., 13-16 PARK ROW, NEW YORK 7, NEW YORK. Telephone: BArclay 7-0600.

FOR SALE: 1—#3A BANBURY MIXER: 2—60" MILLS: 1—48" mill: 1—experimental mill: 3—W & P 1½-gallon stainless steel mixers; 4—200-gallon churns: 2—40-gallon pony mixers: 6 spreaders; 1 doubling calender: 1—3-roll calender: 2 embossing calenders: 1 oven for Organisol: 12 hydraulic presses. Address Box No. 255, care of INDIA RUBBER WORLD.

FOR SALE: BAKER-PERKINS 200-GAL. & 100-GAL. DOUBLE-arm Jack. Mixers, also 50, 20, 9 & Lab. 0.7 gals.: Royle #2 Perfected Extruder: Farrel & Thropp 16" x 36", 2-roll Rubber Mills: also Lab. size, 30", 36", 40", 42", 48", 60", 84" sizes: Rubber Calenders 30", 54", & 60": Rubber Tubers 2" to 6": Large stock Hydraulic Presses from 12" x 12" to 42" x 48" platens, from 50 to 1,500 tons: Hydraulic Pumps & Accumulators: HPM 4 oz. Injection Molding Machine, other sizes 1 to 16 oz.: Stokes & Colton single punch & rotary preform Tablet Machines, ½" to 2": Banbury Mixers: Rotary Cutters: Grinders and Crushers: Mixers: Pumps: Kettles: Tanks, etc. SEND FOR SPECIAL BULLETIN.
WE BUY YOUR SURPLUS MACHINERY
STEIN EQUIPMENT CO.
90 WEST STREET, NEW YORK 6, N. Y.

RUBBER & PLASTICS MACHINERY: 2—THROPP 2-ROLL RUBber mills, 16" x 42", with gear reducers. 1—Royle #1 Extruder, with worm gear reduction drive and motor. Address Box No. 256, care of INDIA RUBBER WORLD.

FOR SALE: 16 x 40 MILL, 50 H.P. MOTOR & CONTROLS. 16 x 42 mill, 60 H.P. motor & controls, very late model. Triplex pump, motor, controls and drive, 22 gpm @ 2000#. #11 Banbury, new, motor and controls. All above for immediate delivery. GRANT ENGINEERING COMPANY, 2640 Prairie Ave., Chicago 16, Ill.

RECONDITIONED 16-PUNCH PREFORM PRESSES STOKES and Colton: Thropp 16" x 30" two-roll mills: heavy-duty double-arm jacketed mixers to 250-gallon capacity. PERRY, 1524 W. Thompson St., Phila. 21, Pa.

(*Classified Advertisements Continued on Page 420*)

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY & SUPPLIES FOR SALE (Cont'd)

FOR SALE: ONE 42" RUBBER MILL, COMPLETE WITH MOTOR and equipment: one 36" Rubber Tire Splitting Machine (Turner Mfg.), latest type—motor driven. Address Box No. 260, care of INDIA RUBBER WORLD.

MACHINERY & SUPPLIES WANTED

WANTED: PLASTIC VINYL SCRAP, BLACK, ALL GAGES, clear and clear transparent in all colors. Top prices paid. Large quantities, carload lots. Address Box No. 257, care of INDIA RUBBER WORLD.

WANTED: DIRECT DRIVEN RUBBER MILL, 36" OR 42" ROLL length, 1.2 to 1.3 roll speed ratio: complete with motor, gear reducer, and stock guards: must be in good condition. Address Box No. 266, care of INDIA RUBBER WORLD.

WANTED

Chemicals — Colors — Pigments
Resins — Solvents — Glues — Plasticizers
Other Raw Materials

CHEMICAL SERVICE CORPORATION
80 Beaver Street, New York 5 — Hanover 2-6970

WANTED: 3 FEinc string filters 8 ft. x 8 ft. or larger, complete, in good condition and acid proof, if possible.

Address Box No. 246, care of India RUBBER WORLD

WANTED — Large engineering firm wishes to acquire several complete Rubber Plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence. Box 1220, 1474 Broadway, New York 18, N. Y.

FOR SALE

RUBBER PLANT

THIS IS A COMBINATION OF A MOLDED AND DIPPED GOODS PLANT LOCATED ON THE WEST COAST. ORGANIZED IN 1933 AND STILL OPERATING UNDER THE SAME MANAGEMENT. COMPLETE EQUIPMENT AND FIXTURES.

DETAILS WILL BE FURNISHED TO FINANCIALLY RESPONSIBLE PARTIES. ADDRESS BOX NO. 261, CARE OF INDIA RUBBER WORLD.

RUBBER MACHINERY

IS OUR BUSINESS

- Mills
- Calenders
- Presses
- Pumps
- Banburys
- Tubers
- Vulcanizers
- Grinders

Immediate Delivery — Good Equipment

Reasonable Prices—Each Installation Engineered

AKRON RUBBER MACHINERY CO.
P. O. Box 88 — WA-0131 — Akron, Ohio

VISTAC-P

(Brand of Polyisobutylene)

Mf'd by Advance Sol. & Chem. Corp.

PRICED LOW
52 drums (55 gals. each)
BOX 665, 217-7 AVE., NEW YORK

GRANULATED CORK

FOR EXTENDING RUBBER

SOUTHLAND CORK COMPANY
P. O. BOX 868 — NORFOLK, VA.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	September, 1948		September, 1947	
UNMANUFACTURED	Quality	Value	Quality	Value
Crude rubber	5,510,387	$1,132,322	2,416,115	$ 363,203
Gutta percha *lbs.*	500	1,749	....	....
Latex *lbs.*	810,462	219,632	184,293	51,923
Rubber, powdered and waste *lbs.*	243,700	26,196	93,100	3,899
Recovered *lbs.*	824,600	65,823	1,616,500	127,178
Synthetic and substitute *lbs.*	129,200	40,478	123,700	32,041
TOTALS	7,518,849	$1,485,200	4,433,708	$578,244
PARTLY MANUFACTURED				
Comb blanks of hard rubber	....	$ 952	....	$ 1,008
Hard rubber in rods or tubes *lbs.*	3,700	2,990	666	527
Rubber thread, not covered *lbs.*	2,007	2,987	6,179	7,661
TOTALS	5,707	$ 6,929	6,845	$ 9,196
MANUFACTURED				
Belting	....	$ 68,659	....	$ 47,732
Boots and shoes of rubber, n.o.p. *prs.*	28,664	29,723	2,858	8,347
Canvas shoes with rubber soles *prs.*	211	685	1,982	5,407
Cement	....	41,049	....	55,777
Clothing of waterproofed cotton or rubber	....	6,003	....	4,859
Druggists' sundries	....	43,932	....	51,670
Gaskets and washers	....	44,154	....	25,986
Gloves *doz. prs.*	188	614	641	3,926
Golf balls *doz.*	3,508	17,501	362	1,966
Heels	11,035	2,344	4,240	418
Hose	....	39,449	....	40,357
Hot water bottles	....	6,861	....	3,636
Inner tubes, n.o.p. *no.*	982	5,549	3,182	7,306
Bicycle *no.*	5,370	2,470	2,666	1,429
Liquid sealing compound	....	1,037	....	9,801
Mats and matting	....	31,952	....	59,143
Nursing nipples *gross*	784	3,302	288	1,076
Packing	....	14,768	....	10,766
Raincoats *no.*	10	140	226	658
Tires, pneumatic, n.o.p. *no.*	2,431	69,867	12,757	168,732
Bicycle *no.*	3,974	7,529	3,306	4,464
Solid for automobile and motor trucks *no.*	84	1,677	27	785
Other	....	5,197	....	14,264
Tire repair material	....	14,905	....	10,935
Other rubber manufactures	....	394,429	....	328,970
TOTALS	....	$ 853,796	....	$ 868,410
TOTAL RUBBER IMPORTS	....	$2,345,925	....	$1,455,850

Exports of Crude and Manufactured Rubber

	September, 1948		September, 1947	
UNMANUFACTURED	Quality	Value	Quality	Value
Crude rubber *lbs.*	6,636,412	$1,300,656	1,584,325	$ 269,325
Waste rubber *lbs.*	936,700	14,030	1,555,700	29,350
TOTALS	7,573,112	$1,314,686	3,140,025	$ 298,675
MANUFACTURED				
Belting, n.o.p. *lbs.*	170,455	$ 121,458	241,658	$ 168,929
Belts, fan	....	12,628	....	3,710
Boots and shoes of rubber, n.o.p. *prs.*	131,467	205,340	315,773	531,975
Canvas shoes with rubber soles *prs.*	40,635	57,564	199,674	171,599
Clothing of rubber and waterproofed clothing	....	27,474	....	23,530
Heels	21,078	268	34,448	3,012
Hose	....	64,187	....	79,768
Inner tubes for motor vehicles *no.*	26,521	78,155	31,244	72,648
Soles *prs.*	....	....	19,054	2,096
Tires, pneumatic for motor vehicles *no.*	46,665	1,094,271	45,157	742,012
Other *no.*	1,110	1,581	5,058	6,107
Wire and cable, copper, insulated	....	285,463	....	236,169
Other rubber manufactures	....	23,264	....	20,032
TOTALS	....	$1,971,653	....	$2,061,584
TOTAL RUBBER EXPORTS	....	$3,286,339	....	$2,360,259

"**Califlux**—Products of the Golden Bear Oil Co." G. B. Report No. 3. July, 1948. Golden Bear Oil Co., Oildale, Calif. 38 pages. As explained in the foreword, the purpose of this booklet is to serve the rubber compounder as an introductory reference manual on petroleum products sold under the trade name of Califlux. Of the five products listed, three are plasticizer-extenders identical with Naftolens, one is a light process oil, and one is a reclaiming oil. Specifications for these materials and their manufacture are discussed, with emphasis on the control of the quality and reproducibility of the oils for use in compounding natural and synthetic rubbers. Compounding techniques to achieve stocks with constant hardness or to maintain elongation and the results with varying amounts of carbon black, various fillers, and for ebonites and semi-ebonites are given.

INDEX TO ADVERTISERS

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